

CONFIDENTIAL
NOT FOR PUBLICATION

CREATIVITY : PROCESS AND PERSONALITY
SIX CASE-STUDIES OF EMINENT PSYCHOLOGISTS

Sponsored by N.I.M.H. Grant 2H-7701-02

Larry Paul Gross
Department of Social Psychology
Columbia University
New York City
July 1964

TABLE OF CONTENTS

	<u>Page</u>
<u>Preface</u>	i-iii
<u>Chapter I</u> Definition: Creativity: Process, Personality	1
<u>Chapter II</u> Structure of Investigation	14
<u>Chapter III</u> Herbert A. Simon: How do People Make Decisions?	17
<u>Chapter IV</u> Milton Rokeach: How do People Believe?	43
<u>Chapter V</u> Abraham H. Maslow: The Mystery of Health	77
<u>Chapter VI</u> David C. McClelland: The Need to Achieve	108
<u>Chapter VII</u> Jerome S. Bruner: Thinking, Learning, Knowing	134
<u>Chapter VIII</u> B. F. Skinner: The Science of Human Behavior	151
<u>Chapter IX</u> Conclusion: A Pluralistic View	171
<u>References</u>	1-11

Larry Paul Gross

July, 1964

IX. Conclusion: A Pluralistic View

No more than we can describe the ideal wife can we describe the ideal science or scientist, or method or question or activity or research. Just as we approve of marriage in general and still leave individual choices to individual tastes, so also can we be pluralistic in science. (Maslow, 1954, p. 4)

We have examined a fair amount of autobiographical recollections of their lives and work as reported by six psychologists whom we have reason to consider creative. What, then, is to be concluded from these about the nature of the creative personality and the creative process?

The most striking impression that the case-studies present to me as a whole is of the variety, the pluralism of backgrounds, development, personality and research interests and activities. But, along with this, and equally important, I feel that there is a possibility for finding some common characteristics, structural if not contentual, which might be relevant to the creative personality and process.

What we have here is not a large scale and quantitative study, and we cannot easily tabulate the similarities and differences of our subjects, nor relate this study with ease to any other study in the same field. But what we do have, and I feel it is at least equally valid, is a body of material with greater depth than most studies, in that the criteria for most of the information is its relevance for the subject; and, above all, material which imparts, I hope, an impression of personality and interests that is able to survive the imposition of external structuring and presentation. In this aspect these studies offer us something usually only available in the autobiographical reflections that are, unfortunately,

all too rare. But they also have a certain advantage in that the very structure, however minimal, imposed by the investigator upon the subject, with its adverse effects on the subject's personal criteria gives the studies a certain, limited degree of comparability. In other words, what is attempted here is a study of the creative personality and process that achieves what McClelland termed a middle level of generality, neither too global nor picaresque and trivial.

The child as father of the man

For obvious reasons our studies do not offer the sort of material necessary for a psychoanalytic or epigenetic discussion of the childhood experiences of the subjects. What can one say about the similarities and differences, on various levels, in the family backgrounds and early development of our creative psychologists? Here, as in the further areas of discussion, it will be necessary to keep one thing in mind. While I think we might isolate certain relevant, even important, common structural qualities, so to speak, the similar or dissimilar aspects of individual life-content cannot be claimed to have any general implications because we are dealing with a very small and non-random sample. None of these conclusions are put forth as revealing laws or even principles of human nature, creative or otherwise.

Religion is a factor of varying importance. So, too, is geographic origin. We have in the sample two subjects with orthodox, semi-ghetto Jewish backgrounds; two with liberal, semi-assimilated Jewish backgrounds; one Methodist minister's son; and one Presbyterian. I might venture to say, somewhat facetiously, that this is a representative sample of contemporary psychologists.

Can we draw any conclusions as to the role of the religious factor? Of all of the subjects, only one reported any religious interests past childhood. But even here, in the case of David McClelland, there is a movement, via conversion, to a less theistic form of religion, to Quakerism. As he put it, "I didn't give (religion) up wholly, as did most of my generation, but converted to a more radical form." In effect, he chose a form of religion more noted for social than theistic concern.

Skinner lost his religious beliefs and interests at an early age. None of the others report ever having any real belief in religion. In our four Jews, we have an interesting spectrum. The two, Simon and Bruner, who grew up in non-religious Jewish families, see this factor in a neutral or even positive light. Simon felt here an element of apartness, but also an "unwillingness to reject the identification." Bruner considers a stressing of intellectual curiosity "one of the benefits of being a Jew, among many." For the two, Maslow and Rokeach, whose families and backgrounds were religious and orthodox, to lesser or greater extents, this was more important, and in a reverse way. For Maslow this was one more way in which he felt divorced from and opposed to his family and his mother in particular. From her he learned to despise superstition and the empty hypocrisy of much religion. Rokeach, forced to go to the yeshivah by a very orthodox family, rebelled so strongly that this very rebellion became one of the most important elements in the militant independence that shaped his professional training and research. Coming from probably the most religious family, Rokeach is easily the most irreligious, even anti-religious (in any common sense of the term) of the subjects;

yet, we have seen, the most influenced by religion--in a negative way. For three of our subjects, being Jewish contributed to a feeling of apartness, Maslow, in particular, emphasizes this, "It definitely meant exile from the society." He is also the only one to report any clear example of religious persecution after childhood.

In general, I think we can say that it is typical of all of the subjects to give up religious belief at an early age, and I think that this is indicative of the intellectual independence that is one of their most striking common characteristics.

All six subjects had siblings, and in each case there is some evidence of sibling rivalry. Two things struck me in this regard. The first is that, to my knowledge, in each case only the subject, of all his siblings, went into an academic profession and achieved prominence as an intellectual. The second fact is that only two of the subjects were eldest sibs, and it is precisely these two, Maslow and Skinner, who are today in the position of being considered leading representatives of distinct points of view. We might talk of Maslovian or Skinnerian psychology, however these differ, in a sense that we would not talk of any of the others. Well, so much for family constellations.

The next area where I think there are interesting comparisons is that of interest development. Simon decided at an early age to be a social scientist, and his training covered a broad spectrum of the social and political sciences, excluding psychology. He ended up in psychology as a result of following the question he was obsessed with to its more elemental aspects. McClelland and Skinner

went to college planning on pursuing literary, or linguistic studies in the "humanities." Only later did they decide to study psychology. Maslow and Rokeach chose psychology early and this choice determined the nature of their entire course of study from that point. Bruner happened almost accidentally on psychology as a field.

To look at it another way, Simon and Skinner chose psychology at a later stage because it asked and answered questions in a way they liked; Rokeach and Maslow had chosen it early for that reason. Bruner and McClelland chose it almost accidentally without the same degree of deliberateness.

Of the six, McClelland and Skinner have the widest background in the humanities. And they each consider this valuable and important. Skinner proudly points to a wide conglomeration of college courses, claiming that he has been able to use "every scrap of that" in his professional life. McClelland thinks he had broadened his interests, mainly by studying many languages and their literatures, to such an extent that he was able in college to narrow his interests and undergo specialization rather than expanding of interests. He, too, sees the availability of general knowledge as essential, "you have to cast a wide net." Maslow, who had been a voracious reader as a child and "lived in the library" went about becoming a psychologist by studying anything and everything he thought might be necessary to "make me a better psychologist."

I think that one of the things we can say generally about all of the subjects is that, in whatever individual fashion, they are

aware of the need for broad and varied knowledge and interest. And, perhaps more importantly, this interest is clearly related to their primary intellectual concerns in psychology. Whether the broadening came before or after they committed themselves to problems of an essentially psychological nature, they see their general knowledge as an important aspect of their work as psychologists. Part of this feeling is nicely stated in something Simon said:

"One rule of the game for me is, if there is something that is intellectually important in the culture, then you have to learn what you have to learn in order to read it, and understand it."
 "Did you do things you really didn't like doing?" (LPG) "Oh, sure. Well, didn't like is a hard term. There is just a lot of drudgery and boredom in learning hard things isn't there, along with the fun. But it's a form of vanity, I guess. I don't like to admit anything is intellectually impossible for me."

Portrait of the thinker

All of our subjects report that they are highly motivated by the need to achieve. Indeed, they have all achieved much, certainly they are all very productive. Their productivity has been, I think it is fair to say, internally rather than externally motivated. Every one of them denied every feeling a necessity to publish to avoid perishing in the usual sense of the phrase. They published out of an inner desire to communicate, and this desire stems, I think, more from a social interest of the sort Adler meant than from a desire for feedback. Often, as with Skinner, they report little or no concern for the opinions of their contemporaries;

it is not for them that they publish, in the last analysis, but for themselves and for "society."

This is connected with a sense of destiny, a need to feel that what you are doing matters, that it makes a difference. Such a sense arises both from the inner implications of a paradigmatic question, as Rokeach points out (cf. Chapter I), and out of their achievement needs. Simon feels that his work, say the use of computer simulation, is the dawn of a new era. Skinner sees his theories as making possible the control of human behavior for the "production" of happier and healthier human beings. Maslow sees a new psychology coming over the horizon, and his work is a trumpet heralding the new era. McClelland is going out, as Alexander, to change history. Bruner is engaged in reforming the practice of education. All feel a certain sense of the prophetic, if not the messianic.

In this relation I think it is interesting to note the extent and nature of their actual social endeavors. Of all the subjects only three are actually engaged in applying their theories to the processes of social change (although Simon is also, to a limited extent, in industrial consultation, but "deep down inside I don't care if General Motors makes a buck next year.") McClelland is engaged on the most ambitious application of his theory to actual social processes. He is attempting, in his words, to use his general speculations as a physicist, to be an engineer now and build particular bridges at particular places at particular moments. Also, his efforts are the most expressive of the total nature of the basic question he has asked. He is, too, the Quaker, who feels

not only that he wants to improve the world, as the others do, but feels the need to go out and try.

Bruner and Skinner are both, in different ways, applying their theoretical thinking to attempt to improve the methods and nature of education in our society. For Skinner the development of the teaching machines is an aspect, and a possible demonstration of a general theory of human behavior. For both there is a genuine social interest and a natural outgrowth of a line of inquiry.

But perhaps the most important point to be made is that none of our subjects are engaging in social change-research of the most radical sort. McClelland might be changing history, but he is doing so within accepted conceptual and instrumental frameworks, however radical the methods. However, to choose the extreme examples, Maslow is not going into the world and teaching children to self-actualize, at most he is working (and this is very important certainly) with management training and other such re-education efforts; Skinner has not gone out and set up an operating operant community; his Walden Two remains fictional speculation; the part he is implementing is more limited.

I think there are two related conclusions to be drawn here. When someone develops a theory of human nature as radical and original as Skinner's or Maslow's, they have abandoned the accepted conceptual and instrumental framework of their society and their profession. This is actually one of the hallmarks of their creative achievement. But, in this they have also made it impossible to indulge in extensive change-research to implement their theories. Their ideas are too radical and too controversial for this. We can easily make the point by imagining what would happen if both Skinner and Maslow, to name but two, were to attempt to apply their theories

and change society in the light of them. When somebody generates so general a theory of human nature, he also makes it impossible, pragmatically, to implement it in any drastic sense. And here we have the second point. The limited applications that are possible, let alone the drastic ones, will of necessity involve compromises with the accepted paradigms. The thinkers who arrive at novel and radical visions of man and society will characteristically be unwilling to submit to half-way transformations and will prefer to keep their most drastic theories in the speculative realm. The implementation of radical change needs to be effected by a different sort. He who hoes his own row of beans and is content will not change society. This is done by the disciples, the apostles, who are both able to compromise and who are not as emotionally involved with the basic nature of the new paradigm as the creator will be of necessity. Moses might give his people the law and bring them to the Promised Land, but once there he must stop and allow the administrator, Joshua, to lead them in. More dramatically, Jesus must be crucified for his disciples to bring about the establishment of the Church Militant. The priests must take over from the prophet. And, in another sense, society may listen to the gadfly, but they are more likely to give him hemlock than to admit his influence. In our sample, it is the one who believes in science as the accumulation of knowledge, not theory, who is going out to change history.

All of the subjects clearly consider themselves to be independent in their thinking, and I think that these judgments are confirmed, if only subjectively, in their reports. I think we can

for the first two years of his life. Maslow, almost entirely friendless as a child, thought of himself as an "ugly child" who was very tall and skinny. Rokeach was a very short boy, much shorter than his age mates. Simon, a Jew in a Christian community, was color-blind and left-handed. In two cases, Simon and Bruner, these factors are related to certain intellectual traits; in two they are more important in their social effects.

Although not all of the subjects were too familiar with the term, all of them, I think, would consider that they are more or less self-actualizing, at least professionally. Several made it clear that in their personal lives, scars left by their childhood environments made certain needs insatiable; but professionally speaking, and in terms of current situations, they can all be termed self-actualizing people. I am not sure that I would call them self-actualized in the way certain of Maslow's original subjects, say Ruth Benedict or Max Wertheimer, probably were, but I feel that they do come under the umbrella of the term. They are all secure, economically and professionally; all seem to have warm, happy family lives; all have achieved prestige and esteem in their professions; and, I think, all are and have been actualizing their potentials in creative processes.

They all consider themselves creative. In fact, although only Maslow actually said this, I think they, too, would tend to define creativity in terms of themselves. But, as Rokeach pointed out, it is also important to realize that "people who aspire to be creative, have a need to think of themselves as creative...I have known people who are not creative to have (the experience of

also confirm such subjective evaluations by examining their professional work, which displays the independence of thought, revealed through formulation novel belief systems and developing novel heuristics and methods, that we postulated as aspects of the creative process.

In all cases we can, to some extent, relate the growth of intellectual independence to feelings of apartness and to elements in the environment and childhood of the subject. Rokeach's case is the most extreme, and, indeed, it is his independence that dominates his intellectual and professional career. But in all the cases there is an independence and an early love of intellectual activity that I feel is an important common characteristic. Although in each person the facts of the matter are different, the specific manifestations of this general phenomenon differ from subject to subject.

Some, as Maslow or Rokeach, developed a trait of independence out of rejecting their familial or religious environments. Others, Bruner in particular, were encouraged by their families to pursue independent and intellectual interests.

All of the subjects report introversive traits as children that reinforced their intellectual preoccupations. Some were more conscious of this, others realized only, as Skinner said, "when I was hit over the head with it. Few had a large group of friends, and in general, these also tended to be children with intellectual interests. Even McClelland, who reports the most social activity of the subjects, had cyclic periods of introversive isolation.

In a majority of the cases, there were physical factors that added to these feelings of apartness, difference. Bruner was blind

creativity)." What we shall have to ask is whether his next statement is true, namely, that "the experience is indistinguishable between creative thinking and non-creative thinking." While this question will be taken up in detail only in the next section, we can say something about it in the present context.

All of our subjects feel they are creative, if for no other reason than because, as Maslow put it, "I have created a lot, and I can whenever I have to." Their judgment rests not only on subjective feelings of creative processes but of having produced creative products. And this judgment is, I feel, largely, if not verifiably, a true one. For one thing, their inclusion in the sample was dictated by their creativity as reflected in identifiable products and professional estimation expressed in prestige and position. They also feel they are creative because of the nature of their creative processes, which is a more difficult and intuitive judgment. Our evaluation of these processes will be based on a degree of intuitive feeling, and a conceptualization, although a somewhat a priori one, of the nature of the creative process. Our subjects are productive; they are highly motivated, by a sense of destiny inter alia; they have rejected previous beliefs and formulated novel ones; in this they fulfill our definition criteria.

One further aspect of this which the definition does not deal with is related to what Ann Roe meant when she observed about creative scientists that "only one trait stood out in common... a willingness to work hard and to work long hours." (Anderson, 1959, p.244) What I am referring to, and I will deal with this again in relation to life goals, is that every one of the subjects feels

that he is doing what he would most like to do. It is my belief that if one were to ask every person in America what they would do if they had their free choice of doing anything they wanted, that only a small minority would answer that they would prefer, with minor modification perhaps, to continue doing precisely what they are doing at the present. These happy few would, I am sure, be exactly those whom we would consider creative. It is these who transcend the dichotomy of work as opposed to play; and it is these, more importantly perhaps, who are able to be altruistic and socially useful while pursuing their most selfish personal interests. While they all might appreciate, and need to spend some time in relaxation, in restful pastimes, they do not desire, need, or use spare time in the way the majority of the population do. For them "vacation" is an almost meaningless term. Their important activities are not work in the usual sense, for they are also play. It is these activities that define their personal identities and give them their human dignity, rather than position, wealth, power or prestige. For that reason, even where they may be department chairmen or fill other prestigious posts, I think they can honestly claim to be essentially uninterested in such matters, as can only those whose power and esteem needs have been satisfied, and who have moved up the hierarchy of needs to the level where their primary motives are self-actualizing ones.

One of the important steps in the creative process, as defined by many thinkers, (e.g. Hutchinson or Osborn), is that of "illumination." This refers to a sudden insight that follows a period of preparation, and even frustration, during which the ideas are "incubating" in the creator's head. This aspect has never been

explained, at least to my satisfaction, by these writers. One thing which is clearly related to it, however, is that of the peak-experience (Maslow, 1962) which is also connected with the self-actualizing person's character. All of the subjects could report some such peak-experience relating to their professional life. I did not ask nor did they deal with such experiences in personal life, although they sometimes gave some information on this. But they all had experienced the joy and excitement of creative insight.

Only one subject reported an illumination of the really classical sort, in bed. Ever since Kekule people have been looking for the great insight conveyed symbolically through the dream. But in my study only Simon could report such an experience. One night, after he had been working on two problems of identification and causality, he had an illumination. "I remember going to bed one night not knowing they were connected and waking up the next morning knowing they were connected."

Simon also reports an insight, which we can call a peak-experience, of a more usual sort. He had been working on a problem in computer simulation, without too much success. He went to New York, it was in October, 1955, he remembers, and was walking along Riverside Drive. "I was thinking about the problems. And suddenly I had just a clear picture of how and why it was we could do it. I felt pretty good for a while afterwards."

Maslow also reports a clear example of a peak-insight, in good classical fashion, on a train. Skinner, who did not in general feel that he had such moments, reported at least one very dramatic one. McClelland felt this way when five years' work on an intuitive

hunch paid off as he had hoped. Bruner also reports such feelings in moments of insight, as does Rokeach. But in Rokeach's case there is something else, which we can use as a means of arriving at an interesting point.

In reporting that he did not get such peak-experiences from great social achievements or from nature, Rokeach explained, "I think I know why. I have to participate. If I am not participating, rather than passively receiving it, I can't really experience it. There is something unclear about getting an experience of this order unless you work for it." I think this is very interesting, not only in terms of Rokeach's personality.

When Ruth Benedict told Abraham Maslow (cf. Chapt. V above) that he was too Western, that he should try to be more Eastern, I think part of what she meant, and that he didn't understand at the time, was that the Western personality was too active, too concerned with active rather than passive experiences. Rokeach feels it is unclear somehow to receive a peak-experience passively, say from nature, or from LSD (and this is related, for me, to the current feelings of many people about the use of LSD and such drugs). Why? Because he hasn't worked for it. This has two implications.

Firstly, we have here what I would call the "Protestant Ethic of peak-experiences." It is entirely congruent with the strongly protestant, puritanic element in our culture for people to feel repelled by the sort of experiences afforded by nature, say, which are best experienced and appreciated in a passive rather than active fashion. Rokeach is the clearest case here, but not the only one. McClelland reports that he has such experiences, "the more sensuous types of pleasure from sights and scenes and

smells and foods and sunsets and that sort of thing," primarily abroad. Why? "It seems that I have to get out of my puritanical, achievement-oriented framework and culture in order to have these feelings." This is what I mean. It is hard, if possible, for most Americans to be passive enough to have the more Tao-istic types of peak-experiences, in which they are not actively participating.

Similarly, when I asked the subjects whether they had "altruistic" peak-experiences, in which they are not actively participating.

Similarly, when I asked the subjects whether they had "altruistic" peak-experiences, only Maslow could report such feelings. The impression was that in the social sphere, too, they felt too "puny," as Rokeach put it, to feel they were participating and have such a peak experience. I would hazard the opinion that this is a central factor in producing the phenomenon in American society of a large group of people with strong political and social convictions who are largely apathetic and uninterested in trying to get the sort of social justice and political reforms they would like. It is not enough to point out, for example, that in France or Italy, where students at least have been traditionally active in such things, there is a tradition that legitimizes and facilitates such movements--for America has a revolutionary history. I think that the puritanic, protestant need to feel effectively active has more to do with it. In other words, I think the lack of what I called the "altruistic peak-experience" is related to the general social and political apathy of most Americans.

Secondly, I think this has to do with religious feelings, though not in any traditional fashion. McClelland reports such

feelings only outside his puritanic framework, but I think this might be related to a religious feeling none of the others report. He is a Quaker and has, I feel, a deep feeling of community and social interest; and I think this is a factor which allows him to have such experiences; if only abroad. Maslow is the only subject who reports this type of experience, the Tao-istic peak-experience, as being common and important. Both from nature and art--music, dancing, etc., and from triumphs of social justice and seeing examples of devotion in other people. And he is also, I feel, the only one who is deeply religious. I think he is religious but not theistic, in a very profound way which is something of a compromise between the Western character and the Eastern Tao-istic way of feeling. His religion, to call it such, is both an appreciation of the natural world and a deep humanistic social interest. And, moreover, I think this humanistic religiosity is expressed in his psychological view of human nature.

Every one of our subjects feels that his life goals have not only been fulfilled, but far beyond his early expectations and ambitions. They are grateful that they have been able to do the work that they have wanted to do and achieved security and happiness in doing this. They feel that they are very fortunate. None would make a wish for something qualitatively different from anything they currently have. I think that this is very important in the sense indicated above when we saw that they are doing what they most want. A person who has been able to be creative in his professional work, and has been recognized by his colleagues, and rewarded both financially and socially to a sufficient extent,

is indeed a fortunate person. But I do not think that the sense of fulfillment is one that derives from a sort of resignation in which people tend to lower their aspiration level and narrow their interests in order to feel fulfilled. I believe that the ambitions they had have been fulfilled, more than fulfilled, and that their aspirations, far from narrowing down to suit reality, have gone higher all the time. They have not rested on their laurels but gone further than they ever thought they could have and continue right on going. This continual progress is not motivated, I think, by a fear of never achieving a secure position; rather, it grows out of the inner necessities of their creative work and out of the never ending need to self-actualize.

Six different people have, of course, six distinct and different backgrounds and personalities. But I think we have seen that these six share many common characteristics, while they differ in many important ways. It is a fair conclusion, I feel, that they are "creative" personalities and that the possible definitions of creative personalities would not be very dissimilar from the portraits drawn in the above case-studies.

The creative process

There were two conceptualizations of the creative process which were utilized in this study. One was a definition of the creative process derived from a number of theories of creativity and creative personalities and which attempted to achieve a certain clarification and integration in a unitive formulation (cf. Chapter I above). The other was an attempt to spell out some of the characteristics of the thought processes that were

indicated by various theories of cognition and creativity; this was used in the interview to suggest to the subjects various possible categories in which to respond and formed the last part of the interview outline (cf. Chapter II, sections III, IV & V). After the research has been done and the case studies presented, what can be said about the creative process in general, and in these six cases in particular?

One thing we must be aware of is the danger of using theoretical models that restrict perception and cognition, and exclude important factors. We always tend to find what we look for. For this reason I did not include my tentative definition in the interview outline. But the danger still remains; and in the following, as I attempt to deal with the subjects in the light of a theoretical framework, there is a great possibility that I shall deform and limit the information and opinions of the study. I only hope that the inner necessities of the data will prevail over such dangers; limitations inherent in the data themselves, due to my set and the sets of my subjects, will be for others to deal with.

The most striking common characteristic of the creative processes reported is one which supports, in essence, the definition I have been using. This characteristic is much like what MacLeod is referring to when he talks about "the 'restructuring of the cognitive field'--a cumbersome expression perhaps, but less unsatisfactory than many." (1962, p. 188). This concept, which derives from Wertheimer in particular, is one of the most important ones, I think, in understanding the creative process. MacLeod makes a good point about this:

When we think creatively we shake ourselves loose from our old assumptions, we see the problem as imposing new requirements, we see old instruments as capable of new functions--the rigid structure of the field has been broken down to permit new configurations. From this point of view it is obvious that wherever restructuring takes place there is the possibility of creative thinking...I should be inclined, however, to include a value dimension and reserve something like "true creativity" for the act which has resulted in a radical restructuring of a major cognitive or motivational system. The "truly creative" person is the person who has "seen the light," has experienced a flood of illumination on a problem or concern with which he is deeply involved, and has thoroughly reoriented his thinking as a result. (*Ibid.* p. 189).

It is primarily in this regard that I feel this research has illuminated the creative process. All of the subjects accomplished their creative achievements through a process of restructuring the field of the problems they were concerned with. And, to lesser or greater extents, they formulated paradigmatic questions, the implications of which, followed out in their work, led to novel and significant views of various aspects of human nature. Whether they illuminated and restructured the nature of achievement motivation, of cognitive development, or went as far as to evolve comprehensive theories of human nature, they share this common accomplishment of paradigmatic re-centering. But there are two further aspects of the process of formulation and research that have been reported in the case-studies.

The role of merely subjective interests of the self is, I think, much overestimated in human actions. Real thinkers forget about themselves in thinking. The main vectors in genuine thought often do not refer to the I with its personal interests; rather they reflect the structural requirements of the given situation. Or when such vectors do refer to the I, this is not just the I as center of subjective striving. Of course, the transition may also lie in the direction of the deeper requirements of the I itself. Sometimes there is a happy coincidence between the requirements of the situation which represents the problem and the real, the deeper needs of the I. (Wertheimer, 1959, p. 180)

I would maintain, and this is the first and perhaps the most important conclusion I see from this research, that it is precisely in those situations where the subjective needs of the creative personality coincide with the requirements of the situation, that the sort of creative process we are considering will emerge. It is for this reason that I would say the subjects in this research have demonstrated self-actualization in their creative work.

In one of the case-studies, that dealing with Milton Rokeach, I attempted to show the manner in which the significant question that he asked and which became, in its implications and scope, a paradigmatic one was a question stemming from the important concerns of his individual personality and life-history. I think that this is true of all of the subjects, although not in so clear a fashion. And, moreover, I feel this is true even where, as with McClelland, the initial choice of a problem was dictated by accidental and pragmatic considerations.

Simon has described three stages in problem-solving activity. These are the identification of problem areas and the choice of a particular problem to be solved; the generation of possible solutions; and the choice and testing of a particular solution. It is my belief that in truly creative thought the perception of a problem, and the choice of a problem to work on, will be particularly determined by the self-actualizing, inner-directed requirements of the creative personality. And, moreover, because I believe, with Adler, in the essential social interest of the creative thinker, I think that the problem chosen for these subjective reasons will be one of general social significance and, hence, socially valuable.

The highly neurotic person will deal with highly subjective things, but these will rarely be socially valuable. The highly creative will solve problems that are important to him personally but will at the same time and by the same actions contribute to his society. In this transcendence of the selfish-altruistic dichotomy we have what Benedict would call the highly synergic nature of the creative process. It is the sense of personal as well as social significance which provides the motivational drive and willingness to work hard and intensively noted by Rokeach, Simon, Roe and others. As Maslow says, in the 12th century people would not have hesitated to apply the term "saint" to such people. But whereas they would refer to work done for the greater glorification of God, or out of self-denying altruism, we can view this as motivated by deep self-actualizing needs as well as social interest.

My feeling that this is true of all my subjects is not one that can easily be demonstrated. Rokeach is, of course, a clear example. In Bruner's case we can point to the frustrations of his early education and his great intellectual curiosity. In McClelland's to a radical Protestant background and a sense of community. In Maslow's to a need to find good, kind, almost parental figures and to understand the meaning of their goodness. In Skinner's to a desire to find the rules of behavior that permit control and direction of this behavior, for whatever reasons. In each case it is my feeling, however unsubstantiated, that the choice of problem is dictated by inner necessities of the creator's personality. And this leads me to the second of the major conclusions I wish to draw.

The notes, data, and publications which I have examined do not show that I ever behaved in the manner of Man Thinking as described by John Stuart Mill or John Dewey or in reconstructions of scientific behavior by other philosophers of science. (Skinner, 1959, p. 89)

Every one of our subjects made it very clear that they never had proceeded in their research by using the hypothetico-deductive model of scientific research as formulated by such people as R. A. Fisher and as taught in many graduate schools. To use a phrase that occurred in almost every one of the interviews, they were just following their noses. And this is demonstrated best in the methods they used.

When a person is pursuing a line of inquiry that is based, consciously or not, on a question that transcends the accepted conceptual and instrumental framework, he will be forced to generate novel methods and instruments as well as theories. This is characteristic of research which is exploring, in Maslow's term, "the frontiers of knowledge."

Sometimes it happened that Einstein was faced with the difficulty that the mathematical tools were not far enough developed to allow a real clarification; nonetheless he would not lose sight of his problem and would often succeed in finding a way eventually, in which the seemingly insuperable difficulties could be surmounted. (Wertheimer, 1959, p. 233).

All of the subjects, in pursuing their paradigmatic questions of the derived sub-problems, invented, without usually realizing it, new instruments and methods of investigation. Having asked questions that could not be asked within the accepted conceptual framework, they needed methods not included in the accepted instrumental framework. And just as they often were unaware of the radical implications of their questions, they frequently did not realize the novelty and value of their technical innovations.

"I invented methods by the dozens without realizing it, I was so absorbed," (Maslow). And many of these have become standard, at least for those who are now settling the territories they pioneered. To name just one example, Skinner developed, as we have seen above, the methods of cumulative recording, various schedules of reinforcement, and the notorious "Skinner box."

It is partly for these reasons that many of the subjects, Maslow in particular, have been accused at one time or another of being "methodologically unsophisticated" or merely sloppy. But in most cases, even while making technical innovations of creative significance, the subjects have still tried to use methods that were rigorous and quantifiable in the traditional sense. Maslow here is the prime exception, but then he has also been working farther outside the accepted framework than any of the others. When one asks questions never asked before, or when one attempts to answer old questions in ways never attempted before, one will necessarily use methods never used before. For this reason none of the subjects, however systematically they pursued their problems, ever used the traditional experimental methods Skinner refers to as "formalized scientific practice," either prospectively or retrospectively. I think this is also related to the usefulness of broad preparation and general knowledge and of the ability to endure a looseness of structure, an ambiguity in conceptualization of the sort emphasized by Skinner, McClelland, Maslow, Simon and Wertheimer. Skinner makes the point nicely:

If I were to conclude that crackpot ideas are to be encouraged, I should probably be told that psychology has already had more than its share of them. If it has, they have been entertained by the wrong people. Reacting against the excesses of psychological quackery, psychologists have developed an enormous concern for scientific respectability. They constantly warn their students against

questionable facts and unsupported theories. As a result the usual Ph.D. thesis is a model of compulsive cautiousness, advancing only the most timid conclusions thoroughly hedged about with qualifications. But it is just the man capable of displaying such admirable caution who needs a touch of uncontrolled speculation. (1959, p. 426.17)

The next point I wish to make about the creative process is related to these last two. By claiming that these thinkers have asked significant questions which have, in the working out of derived problems and implications, turned out to be paradigmatic re-centerings of their field, I am implying that they have produced systematic reformulations of areas of thought in psychology. Such a conclusion is justified only in retrospect. I say this even though I think it is clearly justified. Bruner has developed theories which present a novel and comprehensive view of cognitive development and the process of education. McClelland has evolved a theory of the nature and effect of the need to achieve that he claims will prove the hypothesis "that a particular psychological factor--the need for Achievement--is responsible for economic growth and decline," (1962, p.vii). He has reformulated, not psychological theory so much, as the theory of economic growth. Simon has arrived at a theory of human thinking so comprehensive in its implications that he claims to be able to prove that "all human cognition is decision making" and of the sort explained by his theory. Rokeach, starting with the question of human beliefs, has ended up with a theory of belief systems that allows him "To talk about anything in psychology. I started off by asking a question that has to do with somebody trying to make me believe something (Notice the personal element here) and I end up asking questions that are related to all of personality, attitude organization, and cognitive phenomena." But Maslow and Skinner are the best examples.

Curiously enough, it is the two subjects who are probably furthest from each other in the tone and nature of their psychological viewpoints who are also most similar, I think, in the manner in which they arrived at their viewpoints. This is, I think, a case of structure vs. content of the sort implied when Rokeach speaks of the essential similarity of a fascist and a communist, without any of the authoritarian implications of the analogy.

Skinner started out by looking for some sort of lawful processes in the behavior of organisms. He was relying on the belief of Loeb and Crozier, Pavlov and Watson, that behavior could be described and analyzed objectively, without having to postulate any physiological or psychological determinants that could not be scientifically verified. We have seen how he progressed from one problem to another, never losing sight of the main goal, each time advancing one more step, in method or theory, towards his goal. But only after he was there did he stop and realize the nature of the path taken. His course was not charted before embarking, but navigated as he went along, according to the reefs and the clear passages he found, and guided only by the one star of his ultimate goal. Only later could he formulate accurate maps for the territory conquered. His systematic theory was a retrospective one, and is still unformulated in all of its implications. This is what he is currently occupied with, in his book on teaching and the projected one on the design of cultures; this is what he would consider "a reasonable pattern for one's intellectual life." This is what he means, I think, when he says "If I could have seen in 1928 where I am now, it would have been precisely what I wanted to do at that time. I have been very lucky in being able to follow up and develop along

lines that I wanted to follow. I have never shifted my course at any point." A person who sets out with a very clear idea of where he will end up will, I think, not go very far. Columbus, we recall, expected to discover a route to India, and we all may be grateful that his achievements exceeded his expectations.

Maslow started out by trying to integrate the views of Freud, Adler, Fromm, and Horney into a general view of psychopathology. He felt that they were all right, but it was necessary to achieve some higher integration, for each stressed different parts of the elephant. But this was only the beginning. Other influences became important. He appreciated the holistic-organismic way of looking at things, as well as the psychodynamic; and the whole he ended up with was much more than the sum of its parts. The next step came about through wondering about the personalities of several persons he was very impressed with, yet it also reflected the inner necessities of the problems he was posing. The progression from asking, "what makes people neurotic?" to the question of human health and the highest potentials of human nature, was a slow one but guided by personal needs and the structural requirements of the situation. He has not yet finished constructing the "comprehensive, systematic and empirically based general psychology and philosophy which includes both the depths and the heights of human nature." (1962, p.1v) Perhaps he may never achieve this in his lifetime. But the work of producing a Summa Theologica is of necessity the work of maturity, just as it is proper to youth to venture out of the safe, conquered areas into the uncharted realms of nature and ask the unthinkable questions. But it is only at the top of the mountain that one may look back on the intricate path one has taken to scale the height. Only on the return trip,

gathering up the thread he had let out on his way in, could Theseus see clearly the involutions of the labyrinth he had penetrated.

Finally, I would like to stress once more the ultimate interrelation of the nature of the creative personality and the creative process that will result in products both novel and significant. It is only in asking questions arising from the preoccupations of a unique personality, and from unique confrontations with the world, and the seeking of answers to these questions with methods arising from the nature of the problems and not from traditional practice, that something truly creative is done, that paradigmatic restructurings of the intellectual field are achieved; and only these are ultimately of outstanding social value and radical significance. For this reason Adler can say "Mankind only calls those individuals geniuses who have contributed much to the common welfare. We cannot imagine a genius who has left no advantage to mankind behind him."

But I make this statement without having to claim that any of these systematic reformulations will remain as permanent theories of human nature traditional in their own light. New generations of creative thinkers will come along and violate these belief systems and even destroy them. Any theory, once it has been systematically formulated, has lost its essential characteristic of adaptability to new problem situations and will die like a dinosaur when it is unable to evolve and meet new conditions. But this is precisely the important reason why these theories are only retrospective, why neither Maslow nor Skinner nor any of the others formulated their theories before investigating their problems. Why they can use hypothetico-deductive models only after accumulating their results. However, the fact that any theory, once systematized,