



W.A. Mason. Early Social Deprivation in the Non-human Primates: Implications for Human Behavior. In David C. Glass (Ed.) Environmental Influences. New York: Rockefeller University Press, 1968, 70-101. p.90/91.

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I might summarize this rather sketchy survey of the general features of primate behavioral development and its relation to experience as follows: I have postulated two general programs or trends in behavioral development, one which is dominant in early infancy and then gradually recedes, and another which is relatively inconspicuous in infancy and becomes progressively more prominent. The first trend is inferred from the predominance of contact-seeking behaviors in early infancy, behaviors which we have reason to believe reduce emotional excitement or arousal. The second trend is inferred from the increasing prominence during individual development of social and motor play, and of exploratory and

investigatory behaviors and the like, which increase stimulus input and thereby increase emotional excitement or arousal. Together, the two classes of behaviors - the one arousal-reducing, and the other arousal-increasing - constitute a kind of homeostatic system for the control of emotional states. They work together to pace emotional and social development, carrying the growing individual ever closer to adult norms. The relative prominence of each class changes over time, of course, but neither class disappears entirely, and they retain throughout life their primitive motivational properties.

The psychological consequences of the typical primate deprivation study reflect interference with both developmental trends. Rocking, self-clasping, and self-sucking represent the working out of infantile contact-seeking behaviors in the absence of the natural mother. Once established, they occur most frequently in stressful situations, where they probably function to reduce arousal. The other elements in the deprivation syndrome seem to relate

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primarily to the exploitative trend in development: excessive emotionality is principally a reaction to a reduction in the variety and amount of sensory input in early life. Deficiencies in the organization of motor patterns reflect the lack of opportunities for practice or rehearsal, and deficiencies in communication reflect the lack of opportunities to acquire inter-individual stimulus-response relations. In other words, both of the last two deficiencies are performance deficiencies resulting from conditions inadequate for learning.



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Perhaps there is no need to emphasize that the living series only approximates the evolutionary series. We are not actually descended from the living apes, nor they from the monkeys as we know them today. The linear model of primate evolution implies, however, that the living chimpanzee is more representative of what we were in our remote past than of what we are today. It implies that we can use the living primates as a means for looking into our own behavioral past, for getting at the evolutionary trends that have culminated in human behavior. It suggests that the implications for man of our findings on the nonhuman primates will be better appreciated if they are viewed from within a comparative perspective.

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Adolph Schultz, the anthropologist, finds that rate of growth varies systematically within the primates. He states: "in regard to all parts of postnatal life one can recognize a clear trend toward prolongation, beginning in monkeys, as compared with lemurs, more pronounced in gibbons, still more in all three great apes and by far the most marked in man."

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On the grounds that nature tends to display a certain economy in such matters, we might guess that the reason there is more time for learning in the advanced primates is that more learning is required. Taking this line of reasoning a step further, we might argue that the slowing down of the rate of ontogenetic development and the increasing need for learning are, in fact, different facets of the same evolutionary process, and that this is a process which was identified many years ago and given the name neoteny.

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The behavioral equipment of the newborn monkey, the newborn ape, and the newborn human are so similar that they seem to have been fashioned on the same basic plan: all show the so-called reflex grasping response all show the rooting, oral grasping and sucking patterns involved in the first feeding reactions; all cry when things don't go their way; and all are comforted when properly held.

If we take a closer look at these primitive responses, however, some important differences between species are at once apparent. Place a newborn rhesus monkey on its back and, unless it is given something to cling to, it immediately rights itself. Do the same thing with a newborn chimpanzee



and it may perform weak and irregular sweeping movements with the arms, but it cannot right itself; and it is not able to do so with any real facility until it is several months old. The same ability is not present in the human infant until it is about eight months old. Reflex grasping displays the same trend. An infant monkey can support itself with its hands for as long as half an hour, a chimpanzee for no longer than five minutes, and a human infant for two minutes or less. In general, we can say that the strength and persistence of these primitive infantile responses are less in the human infant than in the chimpanzee, or in the chimpanzee than in the rhesus monkey.

To be sure, these differences reflect the greater developmental maturity of the newborn monkey, but, more important, they also indicate fundamental differences between these species in the way that infant behavior is organized. Viewed as a collection of responses preadapted to nursing and to maintaining contact with the mother, the behavior of

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the chimpanzee never displays the same reflex-like efficiency as that of the monkey. Indeed, if evolution had not brought about complementary changes in the behavior of the chimpanzee mother that permitted her to compensate for the behavioral deficiencies of her infant, its chances of survival would be slim. No human infant, of course, is able to cling, to find the nipple, and to nurse without extensive maternal assistance. The same infantile responses that make the difference between life and death for the rhesus monkey are often viewed in the human infant as mere behavioral curios, without obvious adaptive value.

In the light of these examples, I think you will agree that, even among the earliest organized behaviors to appear in primate infancy, there is evidence of a systematic trend, not only toward



slowing down the rate of development, but also in the way that behavioral organization proceeds. It would not be a gross oversimplification to state that, throughout infancy, the human is a less finished product than the chimpanzee, just as the chimpanzee is a less finished product than the infant monkey.

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All these observations suggest that the number and variety of discrete motor acts, and the tendency to combine such acts spontaneously into new and more complex patterns, increases progressively from monkey to man. One of the pathways toward human behavior thus seems to be a "loosening" of motor patterns, and we can already see the process at work in the great apes. That a similar change has occurred in the internal mechanisms that govern behavior seems most likely. We might refer again to the evidence on the relation between hormones and behavior in primates, and particularly in man. In my own work with young chimpanzees I have found it necessary to speak in



terms of a generalized motivational state, because more specific motives - fear, aggression, hunger, sex - do not seem to be able to provide a satisfactory account of their behavior.

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With so much excellent research being done on the early behavior of human beings, it would be presumptuous of me to try to offer any concrete suggestions as to what these requirements might be. In keeping with the comparative spirit of this inquiry, however, an attempt to characterize the special features of human development will not be out of place:

1. As the result of the general neotenuous trend in primate evolution, the human infant's needs for social stimulation are less specific than those of the nonhuman primates. The range of equivalent stimuli is wider, development is less dependent upon the particular features of stimulation, and the reactions to specific forms of stimulus deprivation are more

variable and diffuse. Thus, it seems likely that the rhesus monkey's self-rocking is a reaction to deprivation of a specific form of stimulation ordinarily provided by the mother. We have good reason to believe that this simple explanation will not apply to the development of self-rocking in humans. Although some form of stimulus deprivation may well be a common element in the etiology of these behaviors in all primates, it is likely that at the human level a wider range of specific causes must be considered.

2. Once a developmental sequence has been set in motion, the human infant will show a greater tendency to elaborate on it than will the monkey or the chimpanzee. The progressive enrichment in stereotyped movements from monkey to man provides one illustration of this tendency, but many other examples could be given. We can see the same process at work in sound production - infant monkeys show little, if any, "spontaneous" sound production; chimpanzees



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"invent" lip noises, clicking sounds, and the like; but only the human infant truly babbles. And we can see it in the progressive enrichment and complication of the patterns of playful exploitation of objects. (It could be argued that this same trend leads to the progressive development of such characteristics as openness and duality of patterning, which the linguist Charles E. Hockett has described as design features of human language.)

3. Because of the retardation of growth rates and the "loosening" of behavioral organization, developmental stages are less sharply delimited in humans than in other primates. Sensitive periods in development are more difficult to establish, there is less likelihood that the withholding of any specific experience will result in developmental arrest, and there is a much stronger tendency for behavior to reflect a blending or intermingling of

different developmental stages, different response patterns, and different motivational systems.

4. These evolutionary changes have meant that the structure and integration of human behavior have become heavily dependent upon environmental support and, at the same time, less dependent upon ~~specific~~ specific forms of experience. Of all the primates, man has gone farthest in an evolutionary venture in which the reliability and efficiency of instinctive patterns have been sacrificed to achieve the behavioral plasticity and the liberation of psychic energies that are so much a part of the human condition.