Dream Concepts of Hausa Children:

A Critique of the "Doctrine of Invariant Sequence" in Cognitive Development

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With her report on the developmental waxing of animistic thinking among the people of Manus (in contrast to the developmental waning of animism in the West) Margaret Mead (1932) initiated an extant intellectual tradition in which the claims to universality of developmental theories are evaluated in the light of cross-cultural evidence. We hope this essay can be said to have some degree of legitimate lineage connection to that eponymous ancestral study in the Admiralty Islands of nearly half a century ago.

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INTRODUCTION

The "doctrine of invariant sequence" is the sine qua non of the cognitive-developmental approach to socialization. Less a true doctrine than a special definition of cognitive development (as a directed process of conceptual change regulated by the logical orderings inherent in concepts), less a dogma than the hypothesization of logically necessary culturally invariant temporal sequences in the way children change their minds, the "doctrine of invariant sequence" has nonetheless provoked considerable controversy and has been described as "the most interesting and often debated aspect of the cognitive-developmental approach" (Hoffman 1970: 265).

From an anthropological perspective the controversial nature of the "doctrine of invariant sequence" is apparent; the "doctrine" restricts the role of cultural determinants to amplifying or dampening the *rate* of conceptual change, and rejects as minimal the influence of cultural determinants on either the nature of conceptual interpretations at any point in a sequence, or the overall direction of their movement.

Kohlberg, a leading exponent of the "cognitive-developmental approach" aptly summarizes the "doctrine of invariant sequence" as follows: "understanding cognitive stages depends upon a logical analysis of orderings inherent in given concepts," and "the existence of cognitive stages implies an invariance of sequence in development, a regularity of stepwise progression regardless of cultural teaching or circumstance. Cultural teaching and experience can speed up or slow down development but it cannot change its order or sequence" (1969:355, 1966:6).

It is the purpose of this essay to evaluate the sense and validity of the "doctrine of invariant sequence" with special reference to a study presented by Kohlberg (1969) as exemplary of the cognitive-developmental approach, namely, his cross-cultural comparative inquiry into children's understandings of the events in their dreams. Our critical discussion of the role of a logical analysis for the ontogeny of understanding is supplemented with data on changes in the dream-event understandings of sixty Hausa children in Nigeria. We judge these data to be particularly relevant because the changes that take place between the initial and ultimate dream-event understandings of Hausa children do not proceed along the single,

invariant temporal ordering so fundamental to cognitive-developmental accounts. The essay concludes with some tentative suggestions for an approach to conceptual change which emphasizes rational criteria beyond the capacity of logic to describe, criteria having to do with the applicability and relevance of forms of understanding.

A COGNITIVE-DEVELOPMENTAL ACCOUNT OF DREAM-EVENT UNDERSTANDINGS: LOGICAL PRIORITIES AND TEMPORAL PRECEDENCES

Kohlberg (1966, 1969) has presented a "cognitive-developmental" account of changes in the way children understand the events in their dreams. It is to his credit to have recognized the *possibility* that while adults around the world are not in accord in their understanding of dream-events, an untutored consensus is arrived at by children in diverse cultures. Presumably uninstructed in their culture's interpretation of dreams, or insensitive to its teachings, American, Canadian, Swiss, Formosan (and, as we shall see, Nigerian) children alter their initially inadequate working hypotheses about the nature of dream events, and come to believe that the events in their dreams are internally located and inherently private "appearances" (instances of "mental imagining").

A universal "spontaneously" evolved childhood understanding of dream-events is a fascinating albeit only partially documented phenomenon. The cognitive-developmental account of changes in children's understandings of dream-events, however, goes much further. On the basis of a logical analysis of relevant dream-event attributes (e.g. their "reality," "sharability," and "location") cognitive-developmental theorists such as Kohlberg prescribe *the* temporal order in which understandings of these attributes must be acquired.

The "doctrine of invariant sequence," this hypothesized existence of a logically necessary culturally invariant temporal sequence in a child's changing understanding of concepts, is the distinctive characteristic of cognitive-developmental accounts. With special reference to changes in children's understandings of dream-events Kohlberg has stated that "the steps [in arriving at the notion that dream-events are unreal, inherently private, and internally located, etc.] represent progressive differentiations of the subjective

and the objective which logically could not have a different order" and "the observed sequence is one which corresponds to an inner logic of the concept of reality itself" (1969:359).

Kohlberg's formulation of the "doctrine of invariant sequence" in this context is consistent with Piaget's presentation. Piaget emphasizes the "originality" of the child's convictions about dream-events "in defiance of personal circumstances, experiences, and overheard conversations" (1929:32) and suggests that the confusion in the child's mind between signs and things signified must be clarified before the child is in a position to distinguish what is internal from what is external (Piaget 1929:121).

The cognitive-developmental prescription of necessary temporal orderings in development (the "doctrine of invariant sequence") leans heavily on the philosophical notion of a relationship of logical priority between activities or attributes. One activity or attribute is logically prior to a second if it would be logically impossible for an instance of a second activity or attribute to occur without an instance of the first occurring, the converse not being so (see Black: 1962). For example, in the sense just defined, "knowing a rule" is logically prior to "deliberately breaking a rule." One may "know a rule" without "deliberately breaking the rule" but it is logically impossible to "deliberately break a rule" without "knowing the rule" (see Alston:1971). The relationship of hierarchical inclusion among attributes is a special case of logical priority. For example, the concept "colored" is logically prior to the concept "red" in the sense that all "red" things are "colored" but not all "colored" things are "red" (see Hamlyn 1971).

Once the notion of a "logical priority" is understood, the "doctrine of invariant sequence" is easily summarized. If there is logical priority among activities or attributes, there *must* be temporal precedence. One must "know a rule" *before* one can "deliberately break it"; one must understand the concept "colored" *before* one can understand the concept "red" (cognitive-developmental theorists would presumably distinguish between having the *concept* "red" and effectively using visual stimuli within a certain range of hue, intensity, and saturation as *discriminative cues*).

Kohlberg reasons this way in his study of children's understandings of dream-events. He lists several attributes relevant to a description of the untutored consensually agreed upon understanding

of dream-events arrived at by children in all cultures. He analyzes the "logical priorities" among the attributes (which he believes describes the "inner logic of the concept of reality") and prescribes the temporal order in which they must occur. Three of the attributes discussed by Kohlberg appear in this study: (1) "reality"—are the dream-events unreal (cases of seeming) or real (cases of being)?; (2) "visibility"—are the dream-events inherently private or capable of public perception?; (3) "location"—are the dream-events internally located or located outside the dreamer's body?

The order in which I have listed these attributes follows Kohlberg's analysis of their "logical priorities." For example, he states, "it is apparent that internality (location of the dream experience inside the body) presupposes unreality (recognition that the dream is not a real object) since a real object could hardly be in the body" (1969:359). As a consequence, the temporal sequence of changes in a child's understandings of dream-events "logically could not have a different order" (1969:359). The child must understand that dream-events are unreal before understanding they are accessible only to his perception; this second understanding must be acquired before the understanding that dream-events happen inside the body. To the query "Why could there not be a culture in which children understand the concept "internally located" before understanding the concept "unreal" the answer is simply "because such an ordering violates logical necessity" (see Nagel:1961).

THE "DOCTRINE OF INVARIANT SEQUENCE" AND CHILDREN'S UNDERSTANDING OF DREAM-EVENTS: A CRITICAL EVALUATION

"If there is logical priority then there must be temporal precedence" is an assertion that can be scrutinized with only certain kinds of evidence. The converse claim, "if there is temporal precedence then there must be logical priority," does not follow from the original assertion. Thus positive evidence of invariant temporal sequence is not relevant. No one denies that an invariant sequence of change may have a nonlogical source (e.g. the invariant occurrence of oral eroticism prior to phallic eroticism in psychosexual development).

Negative evidence, however, (e.g. from the investigation of Hausa children to be reported in this essay) *is* relevant. The out-

come of Kohlberg's "logical analysis" of dream-event attributes is a prescription for a single invariant temporal order in which certain dream-event understandings must be acquired. Hausa children *do not* follow the prescription. Therefore, we must either question the adequacy of the logical account or reject the original assertion, *or both.*

THE ADEQUACY OF THE LOGICAL ACCOUNT

The outcome of an analysis of logical priorities is the elaboration of a set of "criteria for demonstrating a certain form of understanding," that is, "criteria for properly being said to have the concept in question" (Hamlyn 1971). As Hamlyn points out, no one would be convinced that a child understood the concept "red" if he did not also understand the logically prior concept "colored." "Uncolored-red" is a logically impossible concept. We can assess the adequacy of Kohlberg's particular analysis of "the inner logic of the concept of reality" (which he then applies to dream-events) by asking whether it entitles us to reject certain understandings of experience, and hence certain understandings of dream-events, *as logically impossible.*

In Kohlberg's analysis, the distinction between the real and the unreal (between things that are and things that seem to be) is logically prior to the distinction between the inherently private and the potentially public (between things that lack and things that have the potential for perceptual sharing). In turn this distinction is logically prior to the distinction between the internally located and the externally located (with reference to the body). One must have private access to the internally located; what is privately accessible must be unreal.

Kohlberg's analysis might be said to entitle us to accept as logical the following four ways of describing one's experiences:

1. as external perceptions (real, public accessibility, externally located)
2. as mirages (unreal, public accessibility, externally located)
3. as hallucinations (unreal, private accessibility, externally located)
4. as fantasies (unreal, private accessibility, internally located)

One might even describe Kohlberg's view of the necessary temporal order of changes in children's understandings of dream-events

in terms of these four modes of describing experience in general. Children first understand dream-events as external perceptions, then as mirages, then as hallucinations, and finally as fantasies.

Kohlberg's analysis might also be said to entitle us to dismiss as illogical the following four ways of describing one's experiences:

5. as internal perceptions (real, public accessibility, internally located)
6. as internal sensations (real, private accessibility, internally located)
7. as private perceptions (real, private accessibility, externally located)
8. as shared fantasies (unreal, public accessibility, internally located)

But is this the case? Are these last four ways of describing one's experiences any less *logical* than the first four? Internal perceptions (e.g. of intrasomatic events during surgery) and internal sensations (e.g. the pain in one's own stomach about which others may be informed but which they certainly cannot experience [see Ducasse 1961]) are obviously not illogical. No one could reasonably claim that you fail to understand the pain inside your gut because you talk about it as "real." The same can be said for private perceptions and shared fantasies. There are no logical grounds for distinguishing a hallucination (e.g. hearing voices) from a private perception of auditory stimuli. After all, the perceiver may have an entirely unique, and "never to occur again" auditory capacity. Similarly, as unlikely as it might seem, no one can deny on logical grounds the possibility of the existence of a species whose fantasies were pictorially displayed on a small screen located just behind the retina and visible through the pupil from the outside (an internal screen that rapid eye movements during dreaming seem to suggest is imagined by our sensory apparatus).

Thus the rational basis of dream-event understandings seems to reside less in the logic or illogic of certain forms of experiential understanding and more in the evaluation of the differential *applicability* of each form of understanding to *recognized* evidence about the conditions under which dreams are experienced. We return to this point later.

The Logical Analysis of Concepts and Their Acquisition

The question of logical analysis and concept acquisition has been the subject of philosophical exchanges (Alston 1971, Hamlyn

1971. Hanson 1961, Nagel 1961, Toulmin 1961, 1969, 1971*a*) whose influence on our thinking we gratefully acknowledge without implicating their authors in our position.

We reject the cognitive-developmental assertion "if there is logical priority there must be temporal precedence" for the following reasons:

1. Logical relations among concepts are simultaneously occurring relations. If an understanding of these concepts is to be acquired at all, nothing in their logical relatedness implies they must be acquired in a particular temporal order, or for that matter in sequence at all. They may be acquired simultaneously and all at once in final form; they may be acquired dialectically and partially in a kind of intermittent piecemeal fashion.

Stated differently, a logical analysis elaborates the "criteria for demonstrating a certain form of understanding" (Hamlyn 1971) at a single point in time. It has nothing to say about sequences of understandings, and such past understandings (or lack of understanding) are irrelevant to present evaluations of "having a concept." On the basis of a logical analysis (and using Hamlyn's example) one might be entitled to claim at a *single point in time* that a child could not possible understand the concept "red" unless he also understood the concept "colored." But, one would not be entitled to doubt a child's understanding of the concept "red" at some designated point in time on the basis of the child's lack of understanding of the concept "colored" at the immediately preceding point in time. Conversely, one could not claim that a child who understood "red" *must* have understood "colored" at the point in time immediately preceding such an understanding.

2. An *invariant* temporal sequence cannot be prescribed on the basis of a logical analysis because many possible logical orderings are inherent in a concept. As Nagel has remarked (1961) "many concepts can be analyzed in several alternative ways so that the particular set of logical priorities attributed to such concepts depends on which other concepts are taken as primitive."

3. The "doctrine of invariant sequence" is incompatible with experimental evidence on the "psychology of reasoning." The inferential process of the logically untrained individual is dominated by extralogical considerations. Wason and Johnson-Laird (1972), in a series of experiments, have shown how difficult it is for individuals

(with a deductive competence) actually to make purely formal deductions, "how unnatural to think in terms of the truth-functional relations among abstract propositions."

As Wason and Johnson-Laird (1972) point out, it is the content (and the meaning) of what one thinks about and not the canons of any propositional calculus which are decisive for how one thinks. Their subjects display a significant tendency wherever possible to give causal or temporal interpretations to conditional statements. Two logically equivalent conditional statements, such as "if prices increase, the firm goes bankrupt" and "prices increase only if the firm goes bankrupt" (they are logically equivalent in the sense that they are falsified only by an increase in prices without the bankrupcy of the firm) lead to different deductions on the basis of their causal-temporal connotations (1972:73). Asked to reason about abstract materials (hence materials difficult to relate in terms of causative or temporal hypotheses) subjects assume that conditional statements imply their converse, have difficulty with negatives, and are biased towards verification instead of disconfirmation. The authors argue that "even with fully-fledged assertions individuals do not naturally engage in truth-functional thought. They are always ready to leave the logical requirements of the task behind and try to establish some meaningful connection between events" (1972: 81). They conclude from their research that everyday reasoning depends on rational criteria that logic is incapable of characterizing adequately.

A NIGERIAN EXHIBITION OF THE "LOGICALLY IMPOSSIBLE"

Among Hausa children there are alternative sequences by which children change their understandings of dream-events. Initially Hausa children believe the events in their dreams to be real occurrences, potentially capable of public perception, which take place outside their bodies (i.e., external perceptions). Although they come to believe the events in their dreams to be unreal appearances, located inside their bodies, to which only they have potential perceptual access (i.e. fantasies) there is no single transitional route to this ultimate childhood understanding. Betwixt their initial "realism" and subsequent "subjectivism," one set of children comes

to believe that dream-events are real, potentially visible experiences that happen inside their bodies (i.e. internal perceptions); another set of children believe the dream-events are unreal appearances that are invisible to others but have locations outside the body (i.e. hallucinations).

The existence of this type of variance is unintelligible from the cognitive-developmental point of view, a point of view from which the first Hausa transitional type (i.e. dreams understood to be internal perceptions) is simply "logically impossible" (Kohlberg 1969:359). Its documented occurrence calls for a kind of explanation with less emphasis on "logic" and more emphasis on the evaluation of the differential applicability of forms of understanding in relationship to particular experiences (some of which may be culturally variable) and particular criteria for application (some of which may also be culturally variable). This negative evidence from Nigeria is presented below.

SAMPLE

Children were sampled from the central ward of a Hausa market town in northwestern Nigeria.[1] Interviews were conducted with sixty children of both sexes distributed over the ages five to thirteen as follows (Age/Number of Subjects) 5/4, 6/16, 7/11, 8/7, 9/6, 10/8, 11/2, 12/5, 13/1.

PROCEDURE

Children were asked a series of questions concerning their dreams by an indigenous interviewer speaking the native tongue. From the point of view of this study, the following questions are relevant:

1. Do you ever have dreams at night?
2. Tell me a dream you had.
3. Did that (described action or event) really happen?
4. Was the dream in your room or inside you?
5. If I had been there, could I have seen the thing or action dreamt?
6. Whom do you sleep with?
7. Could he (she) have seen your dream?

1. For additional contextual material and another study conducted with approximately the same sample of children, see LeVine and Price-Williams (1974).

Forty-seven children gave answers complete enough to judge the *reality, visibility,* and *location* attributes of their understanding of dream-events. Thirteen additional children gave answers complete enough to judge their understanding of one or two of these attributes.

Results

Intercoder reliability for the children's answers to questions about the *reality, visibility,* and *location* of dream-events averages .92 (Phi). Analyzed individually, each of the three attributes is significantly related to age. As they grow older, Hausa children understand dreams to be unreal cases of mental imagining ($r = .64$, $n = 56$, $p = < .001$), which are inherently private ($r = .60$, $n = 56$, $p = < .001$), and located inside the dreamer's body ($r = .38$, $n = 53$, $p = < .01$).[2]

Table 1 presents the findings on the temporal sequencing of changes in understandings of dream-events. Of eight conceivable kinds of ways of understanding experience in terms of its reality, public accessibility, and location, six occur in Hausa children's understandings of the events in their dreams. Examples from the interviews, of each type of understanding, are given below.

The dream-event as an external perception: (Do you ever have dreams at night?) Yes. (Tell me a dream you had.) I dreamt that a hyena came to our room; when I saw it I began to cry. (Did that really happen?) Yes. It is true that hyena came to our house. (Was the dream in your room or inside you?) The dream is outside. (If I had been there could I have seen the hyena?) You could have been able to see the hyena. (Whom do you sleep with?) I sleep with my mother and my younger brother. (Could your mother have seen the hyena?) My mother could not see it *because she is asleep.*

The dream-event as a mirage: (Do you ever have dreams at night?) Yes. (Tell me a dream you had.) I dreamt my younger sister fell into a well and died. (Did that really happen?) No, because I still see her. (Was the

2. The Hausa children in our sample were also asked about the origin of their dreams (i.e. where do dreams come from?). Only thirty-eight of the children responded to this question. The others "did not know." Of those who "did know," however, older children understood their dream to have an internal origin (e.g. it came from the heart or the eyes instead of the bush or the night); ($r = .53$, $n = 38$, $p = < .001$). Preserving a reasonable sample size was our main consideration in dropping this attribute from our analysis of transitional types.

dream in your room or inside you?) The dream was inside the room. (If I had been there could I have seen your sister dying?) Yes. (Whom do you sleep with?) I sleep with my sister Ladidi. (Could Ladidi have seen your sister dying?) Yes.

The dream-event as an internal perception: (Do you ever have dreams at night?) Yes. (Tell me a dream you had.) I dreamt that both my mother and father were not at home and it was a dark night. Then I heard at the back door a frightening noise, and got frightened and ran away. Then I woke up. (Was it true that you ran away?) Yes. (Was the dream in your room or inside you?) The dream was inside me. (If I had been there could I have seen you running?) No. (Why?) Because you would be asleep. (Whom do you sleep with?) My mother. (Could your mother have seen your dream?) No she could not have seen it because she was asleep. (Suppose she was not asleep?) Then she would have seen it.

The dream-event as a hallucination: (Do you ever have dreams at night?) Yes. (Tell me a dream you had.) A fairy tried to take a car and kill someone, then he tried coming to me but I ran away. (Did that really happen?) No. (Was the dream in your room or inside you?) Inside the room. (If I had been there could I have seen the fairy?) No. (Whom do you sleep with?) Ali. (Could Ali have seen the fairy?) Ali would not be able to see the fairy because the fairy disappears on sight.

The dream-event as an internal sensation: (Do you ever have dreams at night?) Yes. (Tell me a dream you had.) I dreamt I went to an unknown town with my mother. I touched some goods which belonged to the police force and those goods cost two shillings. My mother had only one shilling and so she entered a house and borrowed a shilling. The next day she collected the money and from there I woke up. (Did that really happen?) Yes. (Was the dream in your room or inside you?) Inside me. (If I had been there could I have seen your mother borrowing the money?) No. A man sees his dream alone. (Whom do you sleep with?) Salisu. (Could Salisu have seen your dream?) Salisu could not have seen it because I was the only one that saw it.

The dream-event as a fantasy: (Do you ever have dreams at night?) Yes. (Tell me a dream you had.) Yesterday at Birning Gwari, on our way back from Kaduna I stepped on a grave in an attempt to go and urinate. When we came home I dreamt that the man in the grave came out to hit me and was chasing me around. (Did that really happen?) No. The dead body did not come out. (Was the dream in your room or inside you?) Inside me. (If I had been there could I have seen the dead man chasing

TABLE 1

DREAM-EVENT UNDERSTANDINGS AMONG FORTY-SEVEN HAUSA CHILDREN

	Type of Understanding[*]							
	External perception 1	*Mirage* 2	*Internal perception* 3	*Hallucination* 4	*Internal sensation* 5	*Fantasy* 6	*Private perception* 7	*Shared fantasy* 8
Dream-events are unreal?	0	1	0	1	0	1	0	1
Dream-events are inherently private?	0	0	0	1	1	1	1	0
Dream-events are internally located?	0	0	1	0	1	1	0	1
Number of subjects	18	4	9	7	1	8	0	0
Average age (years: months)	6:2	7:0	7:2	8:7	9:0	10:4	—	—

[*] 0 = No
1 = Yes

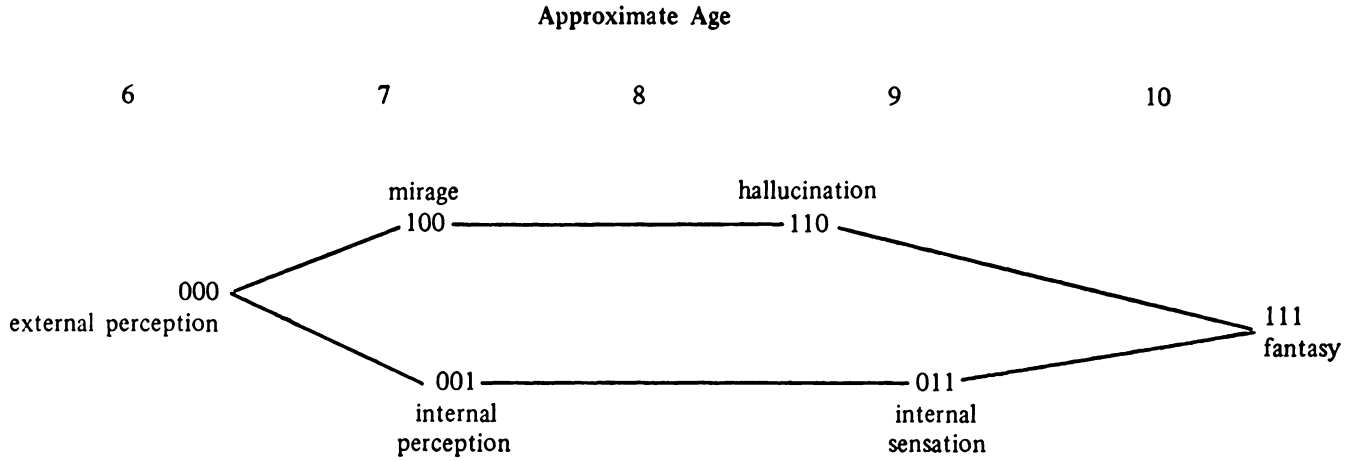
you?) No. You cannot see it because it is just a dream which results from the fear I had when I stepped on the grave. (Whom do you sleep with?) I sleep with Takur and Zayyanu. (Could Takur have seen the dead man chasing you?) Takur would not be able to see the dead body because I am the only one who stepped on the grave and as a result of fear dreamt about the dead man.

The youngest group (average age: 6 years, 2 months) typically understands dream-events to be real occurrences that are visible to others and externally located (i.e. external perceptions). The oldest group (average age: 10 years, 4 months) typically understands dream-events to be unreal cases of mental imagining that are inherently private and internally located with regard to the dreamer's body (i.e. fantasies).

The most frequent transitional type of understanding occurs in nine children who understand dream-events to be real, potentially open to public access, and located inside the body (i.e. as internal perceptions). These children treat dream-events as if they were intrasomatic stimuli *potentially* visible if one could "look through the eyes of the dreamer" or open him up as in an operation.

One reasonable interpretation of the results in table 1 postulates the existence of two alternative temporal sequences by which Hausa children change their minds about the events in their dreams. At approximately age six, children understand dream-events to be real, public, and external (i.e. external perceptions). At age seven, they change their minds about *either* the reality or the externality of these events but not both. They view dream-events as either mirages or internal perceptions. By age nine, dream-events are understood to stand in a relation of privileged access to the dreamer (i.e., they are understood as either hallucinations or internal sensations). By age ten, dream-events are understood as unreal, inherently private, and internally-located (i.e. as fantasies). The two developmental sequences are presented in figure 1.

There are certain general observations to be made about dream-event understandings among Hausa children which may account for our findings. In a culture where children sleep alone it is likely they will disconfirm their belief in the reality of dream-events before they disconfirm their belief in their external location. The reality of certain kinds of dream-events is easily disconfirmed by



The questions: Unreal?/Private?/Internal?

The answers: 0 = No
1 = Yes

FIG. 1. Alternative Temporal Sequences in Hausa Children's Understanding of Dream-Events

waking experience (e.g. one of our subjects dreamt her sister drowned in a well yet was awakened by her in the morning). The external location of dream-events is not so easily disconfirmed especially if no one witnesses their lack of public occurrence.

The difficulty of access to evidence disconfirming the externality of dream-events is somewhat attenuated for Hausa children. They typically have numerous roommates who have the uncanny potential not to see the purported events in the dream. It seems likely in a culture with crowded sleeping quarters such as Hausa that some children receive massive disconfirmation of their initial understanding that dream-events take place outside their bodies before they remember dream-events whose reality can easily be questioned. As we have seen (table 1), several Hausa children in fact come to understand their dream-events as real, publically accessible, yet internally located (as internal perceptions).

DISCUSSION

The existence of considerable variability in the routes by which Nigerian children *change their minds* about dream-events is not surprising. As far as we know no study has ever shown a single invariant sequence of changes in dream-event understandings. Kohlberg (1966, 1969) drops between 30% and 40% of "aberrant" subjects from his analysis of *transitional* invariance, and Laurendeau and Pinard (1962:103–104, 114) explicitly mention the considerable variation observed in the transitional period between "realism" and "subjectivism." This period includes "all the possible steps between the total reification of the dream, attenuated by unskillful attempts at interiorization, on the one hand, and the almost complete subjectivation of the phenomenon together with a residual expression of realism on the other," for example, the form of understanding in which the dream is understood to be "like a story, like a little play" happening inside the child's head, potentially visible to anyone who could open the head to have a look (is this an internal perception reminiscent of our Hausa subjects or a shared fantasy?). What *is* surprising is how little *theoretical* interest has been taken in this undeniable variability. We believe any satisfactory account of the evolution of dream-event understandings must render this variability intelligible not invisible.

Throughout this essay we have been skeptical of the view that

changes in children's understandings of dream-events must follow a single and logically determined order. The principle of the "doctrine of invariant sequence" ("if there is logical priority there must be temporal precedence") and Kohlberg's analysis of the "inner logic of the concept of reality" both seem questionable to us. Documentation of transitional variability in dream-event understandings among the Hausa makes us that much more doubtful. But, so does the initial "realism" of children from diverse cultures.

How are we to interpret the agreement between six-year-old Hausa children and four-year-old American children that the events in their dreams are external perceptions (real, capable of public perception, and externally located)? This seems to us remarkable; the agreement is not made intelligible by suggesting, as do cognitive-developmentalists, that these children lack relevant distinctions that can only appear in a logically determined, nested order. For if six-year-old Hausa children did not distinguish real/unreal, public/private, external/internal, one would expect free variation in their responses; they should fail to comprehend the distinction and thus randomly produce responses. Cognitive-developmental theory fails to explain how it is that lacking, for example, the distinction between real and unreal, young children should understand dream experiences as characteristically *any* one pole of an absent distinction, and why, given that they do respond so characteristically, it is *that* one pole and not the other that is preferred. Either young children understand their dream experiences *and* everyday waking perceptions to be neither real nor unreal (which tells us very little about how they do understand them but is at least consistent with the notion of "lacking a distinction") or, as we think more likely, they distinguish by some criteria the real and unreal but have no good reasons to view dream-events as anything but real.

We believe these "good reasons" for applying one form of understanding and not another, these criteria for evaluating the differential *applicability* of concepts to experience have received too little attention in the study of cognitive development. Toulmin's philosophical investigations of "rationality" (1971*b*, 1972) are germane in this regard. He argues that an account of understanding has less to do with the creation of logical systems, the avoidance of inferential errors, and the formally coherent interdefinition of con-

cepts, and more to do with "the manner and circumstances in which a person is prepared to change or modify his ideas," "the criteria of reference by which choices are made between rival ways of understanding." He believes that concepts and forms of understanding most typically co-exist in conceptual populations or aggregates (i.e. they are very loosely integrated and more often independent) from which choices among potentially relevant members are made with reference to very ungeneralized (local) intellectual problems, contexts, and criteria of relevance.

With regard to dream-events, it seems to us the choice among evolutionary history of the species or the cultural history of the rival forms of understanding is subject to diverse constraints. All knowledge available to the organism, whether preadapted in the group, or postadapted in the life history of the individual, begins with external perception. There may well be a preparation of homo sapiens to understand experiences as external perceptions until such an understanding is shown to be deficient. The informational conditions under which such an evaluation of "deficiency" is likely to be made include the instability over authoritative observers of the effect associated with a phenomenon, that is, its lack of reliability and the consequential difficulty in finding consensual validation for one's judgments about experience (see Jones and Nisbett 1972, and Kelley 1967). Certain other kinds of understandings may be differentially selected against or amplified by one's culture. Schooler and Caudill (1964) for example, in a comparative study of symptoms among schizophrenics in Japanese and American mental hospitals, have commented upon the significantly higher incidence of "hallucinations" among those committed as insane in America, a fact they hypothesize *may* be related to American cultural concerns about "clear-sightedness" and the "accurate perception of reality." Japanese may be able to have "hallucinations" without being quite so readily committed as "mad."

We are raising as an issue the question of the explanatory adequacy of a particular form of understanding in the face of certain kinds of evidence (some of which is and some of which is not culturally variable), certain criteria for what counts as relevant evidence and certain standards for what counts as an adequate explanation (again some of which are and some of which are not culturally variable). For example, certain kinds of evidence are made more

intelligible by certain kinds of understandings. In the face of knowledge that dream-events are not perceived by those who should have been in a position to perceive them, certain understandings of the dream-events (e.g. they are mirages) are simply inadequate.

Our position with regard to children's changing understandings of dream-events is as follows:

Children come to know what it is they mean by any particular form of understanding, and come to reject their initial understanding of dream-events piecemeal and in relation (among other things) to evidence that their way of construing dream-events is inadequate. The specific orderings of changed understandings that do occur reflect the children's differential access to evidence disconfirming their working hypotheses. Some kinds of disconfirming evidence may ultimately be presented to children in all cultures, but at the very least there is no reason to believe all relevant disconfirming evidence is universally presented to children in the same *order* either within or across cultures. Cross-cultural or intracultural variability in the *order* in which disconfirming evidence is presented to children may have no influence on the understanding of dreams ultimately arrived at, but such variability in the order of evidence presentation will be related to the routes by which children achieve this understanding.

In summary, the understanding that dream-events are fantasies may be the most adequate understanding "spontaneously" available to the child in the face of certain universal facts about waking experience, that is, untutored in the entailments of adult dream concepts and the subtleties of their application to everyday experience.[3] But the child's sequence of understandings in arriving at this relatively more adequate of childhood understandings depends heavily on the order in which these overwhelming facts of everyday experience (e.g. the sister who did not drown in the well) are encountered.

Our position places primary emphasis on the adequacy of childhood understandings given access to certain kinds of evidence. As far as we know, no study has ever shown a single invariant se-

3. There is no reason to view ultimate childhood understandings of dream-events as adequate in any absolute sense as anyone must realize who ponders how mental phenomena (which by ultimate childhood definition are inherently private and lack extention in space) can be *located* anywhere (whether internally or externally).

quence of changes in dream-event understandings, but if such an invariant sequence had been reliably documented we would have looked for an invariance *in the order* in which evidence disconfirming of one aspect or another of children's initial dream-event understandings had become available to them, and not for a logically necessary overall direction to conceptual change.

At this time we are not in a position to carry our general observations any further. In the context of our critique, however, the existence of alternative ways of changing one's mind about dream-events among Hausa children, and, as discussed above, its *possible* relationship to aspects of these children's culturally influenced experience (i.e., Hausa sleeping arrangements) should, at the very least, (1) disenchant us from too heavy a reliance on a logical analysis in an account of children's changing understandings of concepts, (2) emphasize the importance of careful studies of these changing understandings in relation to relevant evidence encountered by a child from his *cultural* as well as noncultural experience, and (3) encourage studies of cross-cultural variations (or lack of variation) in the criteria on the basis of which children change their minds.

William James put nicely one the themes of this essay and we will let him have the last word (as quoted by Durkheim 1960:409).

"the enormously rapid multiplication of theories in these latter days has well-nigh upset the notion of any one of them being a more literally objective kind of thing than another. There are so many geometries, so many logics, so many physical and chemical hypotheses, so many classifications, each one of them good for so much and yet not good for everything, that the notion that even the truest formula may be a human device and not a literal transcript has dawned upon us."

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