The Measurement of Animism Across Three Experimental Tasks.

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THE MEASUREMENT OF ANIMISM ACROSS
THREE EXPERIMENTAL TASKS

A Dissertation
Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Psychology

by
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1. Percentages by Age Groups of Placement of 22 Inanimate Card Sort Objects into Alive and Movement Categories
2. Percentages by Age Groups of Placement of 22 Inanimate Card Sort Objects into Alive and Autonomous Movement Categories
ABSTRACT

Previous researchers of the concept of animism, the attribution of life to non-living objects, have been theoretically divided on the issue of whether animistic thought is a useful description of the development of cognition in the child. Huang, Deutsch, and others contend that animistic type responses found by Piaget, Russell and Dennis, and associates, were but an artifact of the experimental conditions of asking leading and suggesting questions. Three tasks were devised for the present research which differed in the degree of abstraction inherent in the stimulus item. Sixty subjects, ages 3, 4, and 5, were tested individually using a verbal questionnaire, a pictorial card sort task, and a story inquiry task involving scaled-model objects. In each situation Ss were asked specifically if objects were alive or not alive.

It was hypothesized that differences in the amount of animism on the 3 tasks would support the notion that a child's thought is quantitatively rather than qualitatively different from that of an adult. Results from the present study indicate that Ss were consistent in attributing or denying life to a majority of items on paired tests. This lends credence to the notion that
young children's responses are not task specific.
Animism scores were calculated for each task by counting
the number of times S called an inanimate object alive.
These scores were found to be significantly correlated
for all Ss. Judges were able to reliably classify
Questionnaire protocols into one of four stages of animism
as defined by Laurendeau and Pinard (1962). The cri-
teria for stages were also applied to the Card Sort task,
with a close correspondence exhibited between those and
the stages on the Questionnaire.

Evidence bearing on the developmental aspect of
animism generally supports Piaget's original formulation
of 4 stages. Sex was found to be non-contributory in
accounting for the variance in scores, whereas age was
found to be highly significant. With increasing age,
Ss were found to be less animistic, more consistent in
their judgments, less dominated by whether an object was
able to move in assessing aliveness, and more willing to
grant anthropomorphic traits without also granting alive-
ness to inanimate objects. Some findings indicate,
however, that the conceptual levels of all subjects are
still in a transitional stage of development. A few
living objects with which Ss probably had had a great
deal of experience were highly unreliable in eliciting
consistent responses across tasks. Plant life was often
denied life, even by the older Ss. Objects involved in an
objectively accidental situation were often blamed for what happened; even though intent was denied, Ss of all ages frequently said that objects should be punished.

Subjects seldom used superficial characteristics of an object to explain why they called it alive or not. Functional qualities were employed most often. The latter explanations sometimes revealed moralistic opinions about the usefulness of objects, illustrating the tendency toward egocentricity in children's thinking.

In summary, with the utilization of 3 experimental tasks judged to be reliable and valid in the measurement of animism, young children in the current study were found to exhibit varying degrees of animism. A remarkable intra-subject consistency prevailed across tasks, yielding a picture of strongly-held beliefs about animism in a developmental sequence.
INTRODUCTION

"At every stage there remain in the conception of nature what we might call 'adherences', fragments of internal experience which still cling to the external world" (Piaget, 1930, p. 244). Animism is one way the child, in his immature state of cognitive development, expresses such adherences. In order to gain an appreciation of the complexities involved in the scientific investigation of animism, the following discussion will outline three major areas of concern. First, the definition of animism, including early philosophical thinking, Piaget's formulation, and usages of the term in anthropology, psychiatry, and psychology. Second, theoretical considerations in the study of animism, including the concept as being exclusively infantile, the effect of experience on animism, and the concept of stages of animistic thinking. And third, methodological problems, including a discussion of methods utilized to study animism, the factors affecting animism in test situations, and the techniques of data analysis. Most of this discussion relates research findings to Piaget's theory, his being the initial systematic formulation of the concept of animism.
Animism Defined

Even a cursory reading of the literature on animism reveals a lack of uniform definitions of animism. This problem is further complicated by the difficulty in interpreting behavior as evidence for the presence or absence of animism, an inferential judgment.

Piaget's Theory

The writer initially conceived of animism as the attribution of animate qualities to inanimate objects. Most experimenters, however, have pressed this to the logical conclusion of attributing "life" to inanimate things. Even Jean Piaget, the pioneer in this field as in so many others in child development, calls animism "the tendency among children to consider things as living and conscious" (1933, p. 380). For Piaget, animism is classified as one of the 17 types of explanations of causality by children of all ages. It is grouped with other prelogical and egocentric types, given by children up to 7 or 8 years of age.

Piaget's theory of the origin of child animism includes the notions of indissociation and introjection. The former term refers to the continuum of psychical and physical features which are not discriminated in the "primitive consciousness". It is this quality which accounts for diffuse animism, the general tendency of children to confuse the living and the inert. Introjection, caused by
the egocentricity of the child, is the tendency to situate in objects or others the reciprocal feelings to those the child experiences from their contact. This action underlies systematic animism, or the explicit animistic beliefs held by the child. Piaget explains that the thinking of the child changes through a dissociation of the physical and psychial characteristics of things. That is, as the child becomes aware of his self and his own thoughts, he denies awareness and thought in objects. "In short, the dissociation of ideas arises from the growth of the consciousness of self" (1929, p. 239).

An important feature of the child's thought is that objects act intentionally. A child at this stage of cognitive development cannot conceive of action without consciousness. Because he is egocentric he is unable to arrive at an objective or impersonal judgment of events. Therefore, an object which provokes pain or fear is seen as doing this intentionally. In support of this egocentricity Piaget cites the reaction children typically have with regard to their relationship to the moon: the child will say with conviction that the moon follows them wherever they go. A 4-year-old child told the author that the moon follows her and no one else, not even her partents or sister.

Piaget has enumerated a series of stages of animism. In the first stage, the child attributes life to usefulness or activity in general. In the next stage life is
attributed only to things which move. The third stage is characterized by calling those things alive which move spontaneously. Finally, the fourth stage restricts life to animals and plants. Piaget assigned approximate age ranges for each of these stages: Stage One from 4 to 6 years, Stage Two, 6 to 7, Stage Three, 8 to 10, and Stage Four, 11 and over.

**Earlier Investigators View Animism**

Although Piaget may have been the first to systematically investigate animism, Dennis (1938) reviewed earlier thoughts on the subject. Writing in the *Natural History of Religion*, Hume said "there is a universal tendency among mankind to conceive all beings like themselves, and to transfer to every object those qualities with which they are familiarly acquainted, and of which they are intimately conscious" (1854, p. 429). Likewise, Tiedemann held that the animistic tendency "... is certainly due to the fact that one always envisages an unknown thing through one that is known" (Murchison & Lager, 1927, p. 229). Other examples are given by Dennis, including Comte's proposal that the earliest forms of religion were based upon "... that tendency of our nature by which Man conceives all external bodies as animated by a life analogous to his own" (1830, p. 155).

**Spontaneous Animism.**

Instances of spontaneous animism are numerous. There are biographical studies prior to Piaget which attest to
the ubiquitous nature of this quality. Tiedemann wrote of his son's comments: "The sun has gone to bed, tomorrow he will get up again, drink his tea and eat his bread and butter" (Murchison & Langer, 1927, p. 229). Dennis (1938) notes a list of more than 50 biographies containing records of children humanizing objects. Dennis (1942) wrote observations of his own daughter, of whom he asked virtually all of Piaget's standard questions. She responded with answers very similar to those of Piaget's subjects.

These records of spontaneous animistic thought are very important in the light of criticism leveled by some who say that it is only the contrived, artificial experimental situation which produces this tendency, and that the child is pushed by force of suggestion to answer in such a manner. Any close observer of children can see incidences of animism, many of which are clearly not part of mere playful fantasy. The author's daughter, at the age of 2 years and 4 months, retrieved a favored blanket from under a chair with the comment, "My mike (blanket) watch t.v., too."

Use of Animism in Psychology Vis a Vis Anthropology

An important distinction must be drawn between how the term "animism" has been used traditionally by psychology and anthropology. E. B. Tylor (1888) was one of the primary forces in defining animism as the granting of souls or spirits to objects, this being the usage of the term in anthropology. Tylor conceived of this process
as primitive man's grappling with the facts of trances, dreams, visions, sleep, and so forth. "Animatism", on the other hand, is used in anthropology as endowing objects with life or vitality. Thus, "animism" to the psychologist is "animatism" to the anthropologist. Werner and Carrison (1944) and Klingberg (1957) were careful to make this distinction, neglected by a majority of the writers. Safier (1964), however, pointed out how the early anthropological use of animism implied a distinction between object and object, between body and soul. Piaget's theory holds that animism does not arise through a separation of object and subject, but through a fusion of the two.

Piaget recognized that the term "animism" had been used by English anthropologists to "describe those beliefs according to which primitive peoples endow nature with 'souls', 'spirits', etc. in order to explain physical phenomena" (1929, p. 169). Levy-Bruhl and others, Piaget continues, have shown that the processes of the primitive mind are much different from this. The primitive mind does not distinguish mind from matter, and thus they endow things with both material properties and with will. Piaget says he does not mean to imply that child animism and similar beliefs in primitive peoples have the same meaning and psychological origins. He is using the term in a generic sense to refer to the tendency of the child to ascribe life and consciousness to non-living things.
Tynni (1958) confuses the issue by calling animism "the tendency to attribute life or consciousness to inanimate objects or to explain natural phenomena in terms of animate forces" (1958, p. 21), thus combining the two usages. A misunderstanding of the term has led several investigators to challenge the results of others while lacking precise knowledge of how the concept is being defined (e.g., Lowrie, 1954).

**Psychoanalytic Usage.**

Psychoanalytic literature on animism refers to the child's psychological closeness to animals. Freud had a great interest in the animal fantasies of children and was impressed by the fact that children do not discriminate sharply between animals and humans. "Children have no scruples over allowing animals to rank as their full equals. Uninhibited as they are in the avowal of their bodily needs, they no doubt feel themselves more akin to animals than to their elders, who may well be a puzzle to them" (Freud, 1950, p. 127). Some would argue that children's books, songs, and toys which portray animals behaving as humans influence the child in this regard. In a sense, Freud contradicted himself in saying that children do not discriminate between animals and humans, and then remarking that children feel more closely related to animals than to adult humans. For Freud, the mechanism which accounts for animism is projection. Piaget argues that mere projection, or introjection in his scheme, is
inadequate to describe animism without the additional notion of indissociation, whereby the child does not separate psychical from physical and attributes "to things not only what belongs to us . . . but also characteristics reciprocal to our own--malice when we are afraid, obedience when we command, . . . etc." (Piaget, 1929, p. 244).

In an effort to study experimentally the effect of animal vs. human stimuli in a story-telling task, several investigators presented children two sets of picture cards, one set with human characters and one with animals. Although the studies varied in terms of stimuli and experimental precision, the results generally indicated no difference in the stories told with regard to length, complexity, clinical usefulness, or other qualitative features (Biersdorf & Marcuse, 1953; Bills, 1950, Bills, et al., 1950; Budoff, 1960). There is some evidence that children in the upper primary grades (age 8 and above) identify more with human pictures (Light, 1954; Boyd & Mandler, 1955), but there seems no marked favor of animal pictures at the younger age levels. These results would seem to support Piaget's indissociation theory rather than the Freudian mechanism of projection whereby the child should favor animals as a vehicle for expressing needs, fears, and other motives.

Two Views of Animism in Psychology

The psychological literature contains basically 2 groups representing what might be termed "positive" and
"negative" approaches. The first describes animism as the result of the immature development of the child's thought, a qualitatively different process from adult logic. The second group holds that there is no such thing as precausal or prelogical thought and that the only difference between child and adult thought is in the amount of knowledge accrued. Members of the "positive" group proclaim the existence of animism, while those of the "negative" stance deny it.

There is argument concerning the nature of the initial stage of development of child thought. Huang and his associates, for example, prefer to describe the situation as one in which the child begins in a neutral and indeterminate state, which is neither animism nor physicalism, and then proceeds by the process of differentiation to the adult state of causality, i.e., physicalism. Klingberg has rephrased this by saying that "growth goes from ignorance to better and better knowledge" (1957, p. 236). Jahoda points out that what "Piaget attempted to do was to show that what in the past had been taken as mere ignorance was in fact a reflection, in a variety of spheres, of the immature state of mental development of the child" (1958a, p. 204).

In the above discussion of the usage of the term "animism" the reader no doubt got a glimpse of the complexity of the issues. The very existence of the behavior is challenged, as is the reality of precausal thinking in
The purpose of the present research is not to settle the latter issue, but rather to investigate further the facets of animism in children. A working operational definition of the term animism for the present study will be those instances of child behavior, both verbal and non-verbal, in which the child attributes to non-living objects characteristics not typically given them by educated adults of the same culture. This would include the attribution of "life" and the endowment of characteristics more specific in nature, such as moving, making noise, and feeling.

Theoretical Issues in the Study of Animism

Jahoda (1958a), Laurendeau and Pinard (1962), and Looft and Bartz (1969) all discussed critically the theoretical and methodological divergences occurring in the vast array of studies on animism. While Jahoda (1958a) was primarily concerned with accounting for cross-cultural variations, the latter two researchers attempted to ferret out the more subtle sources of disagreement. The following paragraphs will briefly review these issues together with previous findings in the area of animism research.

The measurement of animism is at first glance an almost impossible task. It requires the reflections of thought processes from subjects sometimes too young for direct confrontation.
Animism as an Infantile Concept

Studies of animism have been conducted on Ss of all ages, although a majority have centered on school aged children, from about 5 to 12 years old. This possibly would be beyond the age of "diffuse animism" as delineated by Piaget and into the period of "systematic animism", more influenced by social, cultural, and intra-individual factors. At virtually every age level there are both substantiating and refuting studies with regard to Piaget's model of animistic thought.

Piaget's subjects were all children, and therefore he spoke of "child animism". Some criticize him for assuming that animism is present only in the young. Several studies conducted on college students reveal that some animistic responses are obtained even from those with a course in biology (Dennis, 1953; Crannell, 1954; Bell, 1954; Voeks, 1954; Crowell & Dole, 1957; Dennis, 1957; Simmons & Gross, 1957). In an investigation including Ss from 70 to 90 years of age, Dennis and Mallinger (1949) found a surprising amount of animism.

The Effect of Specific Experiences on Animism

Cross-cultural research on animism is of particular importance in the light of long-standing debate over whether the civilized child's mind is equivalent to the mind of primitive man. Comte, in his treatise on religion, spoke of animism in children being like that found in primitives and even in infra-human primates. He illustrated
his convictions by claiming that a monkey, a child, and
a primitive man would all react in a similar way when
confronted with a watch, only their form of expression
differing.

Levy-Bruhl likewise asserted that primitive mentality
is mystical, precausal, and prelogical—qualitatively dif­
ferent from civilized man (1923, 1926). Huang (1943)
mentions that both H. Werner and C. Raspe draw a close
parallelism between the mind of a child and that of primi­
tive peoples. Huang points out that the evidence for such
a relationship is typically speculative and anecdotal. He
challenges the possibility that a child thinks exclusively
in animistic terms across varying conditions.

Klingberg (1957) set out to determine if the animistic
tendency is based upon a primitive mental structure as
hypothesized by Piaget. The author notes that Piaget was
influenced by Levy-Bruhl and "genetic parallels", based
on the recapitulation theory. Since the idea of the
primitive mentality of uncivilized man has been discarded
in ethnology, Klingberg suggests that this constitutes an
error in reasoning by Piaget. He concludes by admitting
that children often attribute life to certain non-living
objects, but says that Piaget's hypothesis is untenable
because of faulty logic and further that it cannot be
tested by empirical means.

Mead (1932) formulated the problem this way: "Was
the thought of primitive children characterized by the
type of animistic premise, anthropomorphic interpretation and faulty logic, which had been recorded for civilized children, or was this type of thought a product of special social environment?" (Mead, 1932, p. 174). In her study of Manus children she found no evidence of "spontaneous animism" and concluded that animistic thought cannot be explained in terms of intellectual immaturity. She concluded that this tendency must be culturally determined rather than an inevitable concomitant of a particular stage of mental development. It must be recognized, however, that Mead's methods were very different from Piaget's and others investigating this area.

Some support for Mead's contention that animism is wholly determined by cultural influences is found in the results of a study involving American school children. Johnson and Josey (1931-32), using Piaget's method without change, could not duplicate the results found with Swiss and French children. One of their explanations was that the English language was superior to the French as an instrument for logical thinking.

In a comprehensive review of cross-cultural research on animism, Jahoda (1958a) covers studies done on white American children (Lerner, 1937; Deutsche, 1937; Russell, 1940a, 1942), Hopi and Zuni Indian children (Dennis & Russell, 1940; Dennis, 1943; Havighurst & Neugarten, 1955), Chinese children (Huang, Chen & Yang, 1935; Huang & Lee, 1945), European children (Askar, 1932; Klingberg, 1957),
and the Manus children of New Guinea (Mead, 1932). Jahoda admits that at first impression the reader is struck by the absence of consistent trends. He then reviews Piaget's theory, with regard to diffuse and systematic animism with special emphasis on social factors which Piaget suggested would favor the persistence of animism. These factors included (1) feelings of participation, (2) feelings of moral obligation, and (3) the language itself. It is easy to conjecture how various cultures would differentially reinforce animism, and thus cross-cultural uniformity of animistic responses could not be anticipated following the age of diffuse animism, ending about 5 years of age. In a study of animism with children of West Africa, Jahoda (1958b) discussed some subtle cultural factors which might explain the low incidences of animism found.

Looft and Bartz (1969) reviewed some empirical evidence both supporting and refuting the notion that environmental influences largely determine the presence of animism. Ezer (1962) found that children from more religious homes tended to give more precausal explanations. Dennis (1942) and Tynni (1958), however, cite results which reject the hypothesis that animism is transmitted from parent to offspring in the "teaching process". It would seem that blind adherence to either extreme of the nature-nurture continuum would lead to a vulnerable theoretical position.

Piaget demonstrated that even when the relevant facts are disclosed to the child that he will not be swayed from
his opinions (1929, p. 175). Contrary to these observations, however, are the results of Looft and Charles (1969). These authors found marked alternation of the life concept in some 8-year-old children after being shown a movie on the biological criteria for living as opposed to non-living things. It seems to this writer that older children may be "prepared" to assimilate such information whereas younger Ss may not show such marked change. It could be further postulated that if the presentation of such information could be on the child's level, whatever age that may be, that a significant change may take place.

The Stage Concept of Animism

There has been much theoretical debate regarding the validity of a stage concept, i.e., whether growth is continuous or discontinuous. Without dwelling on the speculative discussions, suffice it to say that if growth occurs, it may be described in a series of stages. Piaget assigned age limits for each of his stages of animism. Nearly every investigator has taken him to task on this point, although he had warned that:

There is no fully consistent age progression; development may fluctuate with regressions and jumps (p. 190); some children aged between five and six exhibit hardly any animism (p. 178) whilst much older ones may do so (1929, p. 218).

And, further, he said that "We should not dream of guaranteeing the soundness of the present technique as a means of individual diagnosis" (1929, pp. 188-189).
For Piaget, however, the stage concept is more than a simplified description of the growth process. It is not merely that growth occurs, but rather that notions about the world are learned by the child which replace the former concepts. Thus, child thought differs qualitatively from adult thinking. The concepts of filiation and substitution are employed by Laurendeau and Pinard (1962) to describe the progression from prelogical to causative thinking. Two performances hold a relation of filiation when they have common characteristics and when the superior performance derives from the preceding through a process of transformation. This transformation implies an integration of the inferior performance into the superior. On the other hand, development occurs through substitution when subsequent performances simply replace antecedent performances, this process being gradual and with an intermediate stage of the two overlapping. The authors further state that the child's causal thinking seems to develop through substitution rather than filiation. Laurendeau and Pinard (1962) were able to reliably classify 500 Ss into 4 stages of animism, these being refinements of Piaget's original formulations.

The present experiment clearly shows that, in effect, realism, artificialism, animism, and so on, are so many beliefs that disappear little by little to be replaced by more objective, or more physical concepts. A rather long period
is always observed during which primitive notions are still intermingled with explanations of a superior type, but nothing indicates that the superior performances are derived from a transformation or an integration of inferior performances. Physicalism is not the natural expansion of realism or of articialism in the same sense that operational thinking, for example, is the prolongation and the consummation of preoperational thinking (1962, p. 259).

Historically, Comte (1830-42) also believed that later thought stages do not completely eliminate the earlier notions.

Critics of the stage concept point to the overlapping of age groups. This argument is not viable in view of our awareness of individual differences. Huang (1943) proclaims that because a child's response is stimulus determined, no general stage of thinking can be attributed to him. Looft and Bartz (1969) take the critics to task for not approaching the cogent question, that of verifying the constancy of the sequential order of a child's mode of thought. This would best be examined via a longitudinal study involving many Ss, a rare species in psychology today.

Methodological Considerations in the Investigation of Animism

Animism has been studied almost exclusively with verbal techniques. A few researchers utilized experiments involving simple objects testing cause and effect relationships as a means of evaluating the concept of aliveness. Two general trends in verbal techniques have been developed.
One, following Piaget's lead, employs a questionnaire with sufficient inquiry procedures to determine the S's rationale in answering. The other variation is to simply record S's "yes" or "no" responses to the question "Is the _____ alive or not?". Further lack of standardization has been evident in the test items, the wording of the questions, and in the analysis of the data.

Piaget's Clinical Method and Subsequent Refinements

Piaget's clinical method consisted of a question and answer session with each subject. Specifically, the child was asked "Is the _____ alive?", with such stimulus words as moon, river, sun, stone, etc. being supplied. Then follow-up questions were asked, in which the subject is asked to justify his response. Piaget claims that even counter-suggestion cannot move the child to change his opinion, thus providing an impressive measure of the depth of the convictions.

His method has been much criticized, although most of the allegations against it were discussed by Piaget himself, with warnings against the pitfalls intrinsic in it (1929). His point of departure was observation of spontaneous comments by children, then a formulation of a flexible schedule of queries to put to other subjects. Piaget made it clear that one must substantiate interview findings with further pure observation.

Issacs (1930) and Deutsche (1937) severely criticize Piaget's clinical method as being stereotyped and the
questions suggestive, the situation being thus more conducive to eliciting the child's fantasies than his intellectual tools.

A pioneer in the survey questionnaire approach was G. Stanley Hall (1883) who also discussed the types of replies occurring under such conditions. Hall insists, as does Piaget (1929) that despite these disadvantages, there are certain elements "which every tactful and experienced friend of children" learns to ferret out. The hallmark of the clinical method seems to be intuition and experience. Although Piaget painstakingly devoted the first part of *The Child's Conception of the World* (1929) to discussion of the problems inherent in the method, the readings nevertheless left other experimenters without a precise, practical method to use with their subjects. In the light of this problem, Russell and Dennis (1939, 1941) undertook to standardize a method for measuring animism. Their result was a list of 20 objects, including such objects as a stone, tree, broken dish, dog, and broken button. The subject was asked of each object, "Is the ______ alive or dead? Why?" Additional questions were asked regarding autonomous or imparted movement when necessary. Most of the 385 Ss examined by Russess and Dennis (1933, 1941) aged 3 to 15 could be classified as functioning in one of four stages of animism described by Piaget (1933).

A further refinement of the questionnaire technique was developed by Laurendeau and Pinard (1962) for their
investigation of precausal thought. The "concept of life" questionnaire was administered to 500 Ss between the ages of 4 and 13 in Montreal, Canada. The authors introduced the subject matter by asking, "Do you know what it is to be alive? What does it mean? Give me the name of some things which are alive." Then the child was questioned specifically about 22 objects, e.g., "Is a mountain alive? Why do you say it is (not) alive?" Another section of the questionnaire dealt with comparisons: the child was asked if certain things were "more alive" than others. Not surprisingly, the data from this section was quite confusing and the results were eliminated from the main analysis.

Factors Affecting Animism in Test Situations

The meaning of the questions. While many of the early investigators were confident that the question "Is it alive?" would be interpreted similarly by the child as by the experimenter, Russell (1940b) was the first to attempt clarification of just what an affirmative reply to this question might mean. Russell employed a standard set of questions, substituting "knowing" and "feeling" for "living or dead". His results showed significant positive correlations between the stages of animism and the stages of these allied concepts. The correlations, further, were much higher than those obtained between animistic stage and either M.A. or chronological age. Russell interpreted the data as measuring similar concepts and that a measure
of animism was also an index of the S's concept of life. Looft and Bartz (1969) pointed out that Russell used the dichotomy "living" vs. "dead", terms quite different from "living" and "not living". "Dead" implies having once been alive, whereas "not living" does not. Children sometimes classify a broken dish as "dead" because it is of no use (Russell & Dennis, 1939). A further test would be presentation of a situation where an object is repaired and made usable once again. If S said "dead" in response to the fixed object, then his reasoning would be on a higher level than Piaget's Stage One. Piaget (1920) found similar stages of "consciousness" attribution as he did levels of animism. That is, he found that the child in Stage Two of animism would attribute "consciousness" to an object which moved, regardless of whether the movement was spontaneous or imparted.

Several investigations have dealt with contrasting various phrases which all mean "being or not being alive" to an educated adult. Phrases included "living" vs. "non-living" (Crowell & Dole, 1957), "living" vs. "having life" (Huang & Lee, 1945), and "living" vs. "has it life?" (Klingberg, 1957). Some argue that when a child says that something is "living" he does not necessarily endow it with all the biological qualities and/or spiritual characteristics of humans. To determine this, Huang and Lee (1945) asked their subjects if an object was living, has life, and also whether the same object feels pain when
pricked, is capable of wanting and not wanting, can be
good or not good, has anything it must do (function), and
performs this purposely. The authors found that their Ss,
ages 3:5 to 8:7, said an inanimate object was "living"
in only a small percentage of cases. Further, the Ss
often refused to attribute anthropomorphic traits to the
same inanimate objects previously said to "have life". Huang
and Lee interpreted their data as showing that the child's
usage of the term "living" does not have the same meaning
to a child as to an educated adult.

The distinction between "is it living?" and "has it
life?" was studied by Klingberg (1957). He obtained more
animistic answers to the former question, which may have
puzzled some Ss. This confusion may have led to no answer
at all or to one not indicative of the child's thinking.

The use of the question "why?" in order to clarify
the child's rationale has elicited criticism (Klingensmith,
1953). Nass (1956) found that more animistic replies are
given to questions beginning with "why" than to those
starting with "how do you know". There is some reason to
suggest that the "why" question may be interpreted by the
child as a demand for immediate justification of his
position, a "cornering" technique. This may cause the
child to give a rather hurried, superficial response, more
likely to be of an animistic quality. On the other hand,
a "how?" may signal the subject that he is to give more
analytical support, thus encouraging him to take more time
to think and subsequently giving a more mature ("non-animistic") explanation (Looft & Bartz, 1969).

**Items employed on the questionnaire.** The choice of objects in a questionnaire format seems to affect the amount of animism obtained. Klingensmith (1953) found that his Ss were almost 10 times as likely to say that a clock or a candle were alive than to say the same about a match, dish, knife, or comb. Note that the clock and the candle (if the child thinks of it as lighted) both exhibit a seemingly autonomous movement, whereas the other objects do not.

Deutsche (1937) and Huang (1943) report that the child shows marked inconsistencies in responding. They argue that if a child's mode of thinking is generally precausal, then he should attack all problems with this same proclivity. A counter argument is the degree-of-familiarity notion, which holds that the more direct experience a child has with an object, the more likely he will react to it on a realistic, objective, knowledgeable basis. This description of situation confrontation certainly holds for all humans, regardless of age. Studies involving mentally retarded Ss who show a high incidence of animism, indicate the more familiar the S is with the phenomenon, the less animism is exhibited (Granich, 1940; Russell, Ash, & Dennis, 1940). In the light of this notion, then, the objects on a questionnaire list with which the child is the most familiar should be the ones
eliciting the least animism. In general this is true, but it appears that the characteristics of the object might serve as stimulus cues more often than just the amount of direct contact by the child.

**Analyses of the Data**

**What behaviors constitute animism?** A recurrent disagreement has been what behaviors constitute the existence of animism and whether this must be consistently portrayed by the child across all situations. Piaget's theory was interpreted by some as stating that animism is present all the time in younger Ss, whereas others (e.g., Jahoda, 1958a) have culled his writings for exceptions to the rule.

A number of studies concluding that there is no evidence for the presence of animism can be interpreted in another manner. For example, Oakes, (1947) refuted the notion that animistic thought is characteristic in children's thinking. This may be a valid conclusion, but her data does show that from 4% to 10% of the various age groups gave nonphysical explanations. The controversy seems to stem from the disagreement as to what constitutes evidence for the presence of animism.

Strauss (1951) in a critical re-evaluation of the data of Huang and Lee (1945) demonstrated how their conclusions could be refuted by a reinterpretation of the same data. Strauss also was critical of the criteria employed by Huang and Lee (1945).
Individual vs. grouped data. Dissimilar methods of data analysis have caused problems in the exploration of animism. Researchers who generally favor the existence of animism have utilized group analyses. These investigators concentrate on the number of children giving at least one animistic response during the entire experimental procedure. Representatives of this type of analysis are Piaget, the Russell and Dennis studies, and Laurendeau and Pinard (1962). Investigators generally opposed to the hypothesis of precausality have typically analyzed each item, noting the percentage of Ss who react animistically to it. Since children seem to react differentially to many inanimate objects in terms of their willingness to attribute life, it is easy to see how the latter method would yield lower frequencies of animism. Among experimenters using the second approach are Huang and Lee (1945), Klingberg (1957), Klingensmith (1953), and Oakes (1947). Looft and Bartz (1969) suggest experimenter bias may have been operating a priori to produce the choice of units for analysis.

Individual item analysis involves summing the number of "yes" and "no" responses to questions about the objects (Huang & Lee, 1945). As Laurendeau and Pinard (1962) astutely reasoned, a "correct" response does not necessarily indicate that the logic underlying it is also correct. They cite examples of pseudo-solutions, quoting Ausubel and Schiff (1954) and Gréco (1959). It is further argued
that if "one is to estimate correctly any single child's true level of thinking, a global analysis of the entire pattern of his responses is necessary" (Looft & Bartz, 1969, p. 6). Looft and Bartz (1969) conclude their remarks on this question by stating that while differences in data analysis account somewhat for some divergent results, studies using the same methods of examination can also yield markedly disparate findings.

The Problem

The present research seeks to provide information on the following questions:

1. To what extent are animistic responses situation and task specific? Some researchers have used verbal questionnaire tasks with varying degrees of inquiry; others have presented demonstrations of physical experiments designed to test the child's knowledge of cause and effect relationships. It is difficult to compare results from these two types of situations. In the present study, the concept of aliveness was tested in three situations which differ in the degree of abstraction of the stimuli. Responses to items on a verbal questionnaire, a pictorial card sort, and a model representation in a story inquiry task were compared.

2. Are there differences in the amount of animism as a function of age and sex? Previous studies have failed to demonstrate sex differences, and there is a marked disagreement about developmental decrements in animism.
The present study involved a 3 year age range designed to ferret out age differences in animistic thinking.

3. What criteria do preschool Ss use in inferring the concept of "living" as opposed to "non-living" in objects? The method of having children separate objects or pictures into several categories which might be associated with the concept of animism was used, following the suggestion of Looft and Bartz (1969; personal communication with Looft, 1969). The use of a card sorting task in the present study provided information on how Ss define "living" and "not living", as well as the consistency of application of these concepts across exemplars.
METHOD

Subjects
The sample consisted of 60 children between the ages of 3 and 6 years. The Ss, from private nursery schools and public kindergarten classes in the Los Angeles area, were selected on the basis of the absence of any significant behavioral or emotional problem. Freedom from gross behavioral problems was judged on the basis of interviews with the teachers. The kindergarten Ss had at least one year of nursery school experience. Ten Ss, five females and five males, constituted each 6-month age block.

Procedure
The study included three tasks, each presented individually with order counter-balanced across Ss. Because of the high activity level and short attention span of the Ss, three sessions were required to complete the testing. An attempt was made to have sessions on consecutive school days. The maximum time span for any one S was 10 days. The procedures for the three experimental tasks follow.

Questionnaire. The Concept of Life Questionnaire devised by Laurendeau and Pinard (1962) was used in this study. Laurendeau and Pinard caution that verbal tests on Ss less than 4 years of age are ineffective, however use of questionnaires in previous studies of animism
warranted inclusion of this technique in a cross-method comparison. Two items were added to the Laurendeau-Pinard instrument to gain comparability with other instruments used in this study. The format for the task follows:

**Instructions to E:** Ask the child each one of the following questions, trying always to make sure he understands it well. When necessary, the questions may be repeated. Record all answers **verbatim**.

**General Questions:** "Do you know what it is to be alive, to be living?" "Give me the name of some things which are alive."

**Specific Questions:** Note: Each item was typed on a separate 3" x 5" card. The cards were shuffled for each S to ensure a random presentation. "You know what a _____ is, don't you? Is a _____ alive?" "Why do you say that it is (not) alive?"

Continue with the remaining 22 items, presenting each one with the questions, "Is a _____ alive?"

After S responds, then ask, "Why do you say that it is (not) alive?"

The 23 test items were as follows:

1. mountain 9. tree 17. airplane
2. table 10. bicycle 18. fire
3. cat 11. pencil 19. rain
4. lamp 12. sun 20. snake
5. bird 13. car 21. fish
6. wind 14. cloud 22. child (same sex as S)
7. fly 15. watch 23. dog
8. flower 16. bell
Card Sort task. Materials for this task consisted of 32 cards with pictures of the following objects:

*1. mountain  *17. fly
*2. sun  *18. fire
3. broken pencil  *19. flower
*4. car  20. broken dish
5. tricycle with 1 wheel  *21. boy
*6. table  *22. rain
*7. cat  *23. tree
*8. cloud  *24. snake
*9. lamp  25. motorcycle
*10. watch  *26. fish
11. jack-in-the-box  27. crayon
*12. bird  28. Raggedy Ann doll
*13. bell  29. t.v. set
14. smoke  30. knife
15. pair of smashed glasses  *31. dog
*16. airplane  *32. girl

Items marked with an * are pictures of objects also presented on the Questionnaire. Only the picture of the child the same sex as $S$ was presented. The damaged items were included to test further the finding that a differential response is obtained to such objects because of their broken, and hence, useless state (Russell & Dennis, 1939).

Pictures were colored photographs, 3-1/2" by 3-1/2" with a pastel background, mounted on white mat board 4" by 4", and covered with clear contact paper. The cards were numbered in the upper left hand corner to simplify scoring. The cards were shuffled before each presentation.

Six additional cards, constructed in an identical manner, served as sample stimuli. Objects pictured on these cards included:

1. stone  4. push toy
2. horses  5. pull toy
3. bricks  6. baby
Photographs of the cards used in this task are found in Appendix A.

The set of 31 test cards were separated into the following categories: (1) moves vs. doesn't move, (2) is alive vs. is not alive. Ss were asked to sort cards they had placed in the "moves" category into one of the additional categories, "moves autonomously" or "doesn't move autonomously". Thus, there were 2 complete sorts and 1 partial sort.

The procedure for the card sort tasks follows:

  E accompanied S to the experimental situation and directed S to sit in a chair at a table of the approximate height for the child. E sat directly opposite from S.

  Sample items:

  E placed the two sample cards depicting the horses and the bricks on the table approximately 8 inches apart. E said, "Here are pictures of two things, some horses (pointing) and some bricks (pointing). One of these things moves and one thing does not move. Put your finger on the thing that moves." If S responded correctly, E said "Fine" or "Good". Then E said "Now put your finger on the thing which does not move." If S again responded correctly, E praised his response and proceeded with the test items.

  If S chose the incorrect sample card, E said, "No, this (indicating the correct choice) is the thing that moves. Now, put your finger on the thing which does not move". If S responded correctly, E said "Fine" or "Good".
Then the second set of sample cards was placed on top of the first set. E said "Here are pictures of a baby and a stone. Put your finger on the thing which moves." The rest of the sample directions were identical to those of the first sample. Following the second sample, E proceeded with the test items.

The complete list of the sample cards for the categories follows:

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>SAMPLE CARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moves vs. doesn't move.</td>
<td>1) horse and bricks</td>
</tr>
<tr>
<td></td>
<td>2) baby and stone</td>
</tr>
<tr>
<td>Moves autonomously vs.</td>
<td>1) horse and push toy</td>
</tr>
<tr>
<td>doesn't move autonomously.</td>
<td>2) baby and pull toy</td>
</tr>
<tr>
<td>Is it alive vs. is not</td>
<td>1) baby and bricks</td>
</tr>
<tr>
<td>not alive.</td>
<td>2) horse and stone</td>
</tr>
</tbody>
</table>

Test items:

The first test card was placed on the table below and equidistant from the sample cards which remained visible. E said, "Does this not move, or does it move?" After S indicated his response, E said, "Then it goes right here" (placing the card directly below the corresponding sample, turning the test card face down in the process). "Things which move go here (indicating the position on the table relative to the horse card) and the things which do not move go here" (indicating the appropriate place). The remainder of the test cards were presented, each being held slightly above the table to encourage S to take the card and place it in the stack he selected.
The additional categories of the card sort were presented in the same manner.

Order and sequences of positive and negative forms of the question were randomized, within the constraints that half of the questions were positive forms, and that runs were limited to 2. The following are positive and negative question forms:

1. a. Does this move or does it not move?  
b. Does this not move or does it move?

2. a. Does this move by itself or does it not move by itself?  
b. Does this not move by itself or does it move by itself?

3. a. Is this alive or is it not alive?  
b. Is this not alive or is it alive?

Reliability:

A reliability study of the Card Sort stimuli was conducted using 10 3-year-old Ss, half of them being younger than 3 years 7 months. All Ss attended a private nursery school.

The test was administered twice, with one week interval between sessions. The procedure for the test follows:

E accompanied S to the experimental situation and directed S to sit in a chair at a table of the appropriate height for the child. E sat directly opposite S.

E placed the 2 sample cards depicting the baby and the bricks on the table with the comment, "Here are two pictures. One thing, the baby (pointing to the baby) is alive, but the bricks are not alive." If S succeeded, E
said "Fine" or "Good." Then _E_ said, "Now put your finger on the thing which is not alive." The correct response was reinforced. If _S_ failed the first sample, _E_ corrected him and presented the second sample, pictures of a horse and a stone. The procedure was identical to that of the first sample. The 31 test items were then presented using the "Alive-Not Alive" categories in the same manner as described above for the actual research.

A Spearman Rank correlation coefficient was performed. The _S's_ rank was determined by the total number of cards in which objects depicted were called alive compared to the number so labeled by the other 9 _Ss_ for the session. The resulting correlation represents the relative stability of position of the _Ss_ across the two sessions. This yielded an _r_s_ = .908. From this data, the author concluded that the responses of the 3-year-olds to the Card Sort items are sufficiently reliable for the purposes of this study. The high reliability in response stability for the 3-year-olds indicates that the responses of older children would also show stability.

**Story Inquiry task.** The materials for this task included a stage depicting an outdoor scene, a model of a tree, and 5 toy objects. The 1/4" plywood floor of the stage measured 3' by 4' upon which artificial grass was attached. Finely ground brown sawdust was used to outline a road. The 1/4" plywood background of the stage measured
2' high and 4' wide. This was painted pale blue, with 5 fluffy white clouds. A circle 2" in diameter was drilled, through which the head of a flashlight was inserted. A circle with rays was cut from yellow tissue paper placed over frosted acetate. This was positioned over the hole in the background to represent the sun.

The artificial tree was constructed using a branch from an actual bush. Small plastic leaves were pasted on the branches. The tree was 24" high and approximately 24" across at the top. The toys included 2 orange steel Volkswagons, one having a smashed roof, a bendable white and brown dog resembling a fox terrier and measuring 1" high and 1" long, and bendable boy and girl dolls, each 2-3/4" high. The scale of the objects was 3/4" to 1'. Photographs of the stimuli are found in Appendix B.

The procedure for the Story Inquiry Task follows:

The stage was set on a table of appropriate height in the experimental room, with the tree positioned on the grass in the upper right quadrant of the floor of the stage. Four of the toy objects were arranged randomly to the left of the stage. Only the doll of the same sex was used with each S. E led the child to the stage and said, "Here are some things which you may play with or do whatever you wish." E allowed S to investigate the equipment for 3 minutes. Then E said, "Now I have some stories I would like for you to hear. I will move some of the toys around while the tape recorder plays a story." S was
seated in a chair in front of the stage while the stories were being presented. E began the tape of the first story and manipulated the appropriate objects. After the first story was completed, E said, "Now I have some questions about the story we just saw." The set of questions corresponding to the story presented was asked. E recorded S's answers verbatim on a data sheet. Then the second story and set of questions was presented, then the third. Stories were presented in a counterbalanced order across Ss.

Each story involved 4 primary objects and 2 background objects not directly involved in the action. The same 6 objects were used in all 3 stories: a dog, a child (same sex as S), a tree, a car, the sun, and the clouds. The list included 3 living and 3 non-living objects. Previous research has shown that younger children often regard a tree as not living (Laurendeau and Pinard, 1962; Huang and Lee, 1945), thus its inclusion in the present study.

The actions of the three stories used for this task were as follows: (1) the car in the road hits the dog, (2) a branch from the tree falls and smashes the top of the car, and (3) the child is running and trips over the dog. The tape transcripts of the narrations of the stories follow:

"Here are some stories about a boy (girl), a dog, a car, and a tree. The sun is shining in the sky and some clouds are scattered about. Here is our first story."
(Story 1) "The boy (girl) is playing in the grass. The car is in the street. The dog looks as though he's pretty close to the street. I hope that car isn't moving. (pause) Now the dog is going farther out into the street. The car is moving. (pause) The car is really getting close to the dog now. The dog doesn't see the car coming. (pause) The car has hit the dog and he's lying down in the street." (End of story 1)

(Story 2) "In this story we see the car parked beneath the tree. The boy(girl) and the dog are playing in the grass nearby (pause) It looks like something is happening to a branch on the tree. (pause) Yes, the branch has broken off the tree and has fallen on top of the car. (pause) The branch really crushed the top of the car." (End of story 2).

(Story 3) "This time the car is parked by the street. The dog is lying down in the grass and the boy (girl) is running. (pause) It looks as though the boy (girl) is not watching where he's (she's) going. (pause) The boy (girl) had better look quickly or he (she) might run into the dog. (pause) The boy (girl) didn't see the dog and has tripped over him. (pause) He's (she's) really taking a tumble. (pause) The boy (girl) has fallen all the way over the dog and is lying in the grass." (End of story 3)

The inquiry questions for the stories follow. Each of the primary questions is numbered. The additional
questions were asked if S responded affirmatively to the primary question.

Story 1: Car hits the dog.

1. The car hit the dog; is it the car's fault?
   How is it the car's fault?

2. Is it the dog's fault?
   How is it the dog's fault?

3. Did the car mean to hit the dog?

4. Should someone or something be punished for what happened? Who should be punished? How should they be punished?

5. Does the sun know what happened?
   How does the sun feel about what happened?

6. Does the tree know what happened?
   How does the tree feel about what happened?

7. Do the clouds know what happened?
   How does the tree feel about what happened?

8. Does the boy (girl) know what happened?
   How does the boy (girl) feel about what happened?

Story 2: Branch hits the car.

1. The branch hit the car; is it the tree's fault?
   How is it the tree's fault?

2. Is it the car's fault?
   How is it the car's fault?

3. Did the tree branch mean to hit the car?

4. Should someone or something be punished for what happened? Who should be punished? How should they be punished?

5. Do the coulds know what happened?
   How do the clouds feel about what happened?

6. Does the boy (girl) know what happened?
   How does the boy (girl) feel about what happened.

7. Does the sun know what happened?
   How does the sun feel about what happened?
8. Does the dog know what happened?  
   How does the dog feel about what happened?

Story 3: Child trips over the dog.

1. The boy (girl) tripped over the dog; is it the boy (girl's) fault? How is it the boy's (girl's) fault?

2. Is it the dog's fault?  
   How is it the dog's fault?

3. Did the dog mean to trip the boy (girl)?

4. Should someone or something be punished for what happened? Who should be punished? How should they be punished?

5. Does the tree know what happened?  
   How does the tree feel about what happened?

6. Do the clouds know what happened?  
   How do the clouds feel about what happened?

7. Does the car know what happened?  
   How does the car feel about what happened?

8. Does the sun know what happened?  
   How does the sun feel about what happened?

After the third story inquiry S was asked specifically if the 6 objects common to all 3 tasks were alive or not alive. The 6 objects were the sun, the clouds, the car, the tree, the dog, and the boy or girl. Names of the 6 objects were typed on 2" by 3" cards and shuffled before each presentation. Positive and negative forms of the question were alternated, with the positive form occurring first. The forms of the question were:

   Is the _____ alive or is it not alive?

   Is the _____ not alive or is it alive?
Data Analysis

Validity and reliability of the experimental tasks. Validity of the instruments used in this study rests on two procedures. First, the items were generated to reflect the construct animism as defined. Second, consistent response patterns by subjects on similar items on the standardized instrument, the Questionnaire test, and the new instruments would reflect concurrent validity. Animism, as defined in this study is the attribution of life to inanimate objects. The Ss in the present research were asked directly in each of three situations if objects were alive or not alive.

High interjudge reliability for the Questionnaire task was obtained by Laurendeau & Pinard. These authors and an independent judge classified 97% of the protocols in the same stage (Laurendeau & Pinard, 1962). High retest reliability for items on the Card Sort was reported in an earlier section of this paper. The Story Inquiry task was not tested directly for consistency in responding, but items for this instrument were assumed to be reliable on the basis of results of the other 2 tasks.

Three additional statistical techniques were employed to estimate item reliability across all 3 tasks, representing some aspects of both construct validity and intra-subject reliability. Two techniques were used to evaluate intra-subject consistency in responding over the 3 tasks. (1) Tetrachoric correlations ($r_t$) were calculated for items
common to 2 or 3 of the experimental situations. (2) As an indication of response consistency over all 3 tasks, instances of perfect response consistency for 6 items common to all situations were tallied by age groups. A third technique was used to indicate if characteristics of the stimulus items had some degree of consistency over the 3 situations. Differences in proportions of Ss calling each of 4 objects alive on the 3 tasks was interpreted as situational independence of subject responses. The 4 objects common to all modes of presentation were the sun, clouds, tree, and car. The proportions were tested by $X^2$. The null hypothesis stated that there was no difference among the tasks in the number of Ss responding "alive."

**Examination of Task Equivalence**

The first question posed by this research was the extent to which animistic responses are situation and task specific. To shed some light on this question, a system for scoring animism for each task was devised. The scoring criteria follow:

**Questionnaire.** The protocols were scored such that an animistic response (where an inanimate object was said to be alive) received 1 point and a non-animistic response 0. S's animism score was the total number of items to which S made an animistic response. The maximum number of points was 14, the number of items which presented inanimate objects.
Card Sort. The score for the 31 items on this task was calculated in a manner identical to the Questionnaire, with the maximum number of points being 22.

Story Inquiry. Individual scores for this task consisted of the number of affirmative replies given to the following questions:

1. Does the sun know what happened? (Story 1)
2. Does the tree know what happened? (Story 1)
3. Do the clouds know what happened? (Story 1)
4. Do the clouds know what happened? (Story 2)
5. Does the sun know what happened? (Story 2)
6. Does the tree know what happened? (Story 3)
7. Do the clouds know what happened? (Story 3)
8. Does the car know what happened? (Story 3)
9. Does the sun know what happened? (Story 3)
10. Is the sun alive (End of last story)
11. Is the car alive? (End of last story)
12. Are the clouds alive? (End of last story)

The maximum number of points for this task was 12. Animism scores were intercorrelated for the three tasks as an index of task equivalence.

As a further test of the differential effect of tasks, Questionnaire and Card Sort protocols were also rated as to the stages achieved by Ss on each task. On the basis of data secured from 500 Ss, Laurendeau and Pinard (1962)
revised the stages of animism originally posited by Piaget (1929). The 4 stages of animism formulated by Laurendeau and Pinard were used to categorize Ss in the current study on the Questionnaire and the Card Sort. Two psychologists and the author working without consultation used the following criteria to classify the protocols for each S on the Questionnaire. These criteria are Laurendeau and Pinard's descriptions of the thinking typical of children in each stage of animism.

Stage 0: Incomprehension or refusal. This stage comprises those Ss who could not understand the questions or answered at random without ever giving valid explanations. Often a subject in Stage 0 will use the same reason to attribute and deny life to objects, thus illustrating his ignorance of logical operations. This results in contradictions in the protocol, typical of infantile, prelogical thinking. The child's "yes's" and "no's" often seem to be independent of his explanations.

Stage 1: Animistic Thinking Based on Usefulness, Anthropomorphism, or Movement. Subjects in this stage commit errors of the animistic type by attributing life to one or many inanimate objects. These Ss use criteria which are imperfect, but the authors remark on the consistency of the child's thinking. "He never resorts to the same reason to attribute or refuse life" (Laurendeau & Pinard, 1962, p. 145). Frequently a combination of two or even three of these criteria can be seen in explanations.
Some children may refuse life to plants and trees by reason that they do not move, or are perceived by the child to be immobile.

Stage 2: **Autonomous Movement with Some Residual Thinking.** This stage, characterized as one of transition, is distinguished from Stage 1 by the discovery of 2 distinct sources of movement. Only one of these, that is, where the source of the movement is the object itself, now serves as a criterion for life. Laurendeau and Pinard discuss how this criterion alone does not serve to cause the total disappearance of animism. Most importantly, children continue for some time to delude themselves as to the real source of movement, particularly with regard to those objects most removed from direct experience, such as the wind, sun, moon, etc. Another reason is that "the discovery of autonomous movement does not definitely displace the inadequate or imperfect criteria of the first stage. In fact, the most frequent occurrence is that the child relies upon autonomy to justify some of his responses, but for the other responses still resorts frequently to usefulness of objects, to their possessing anthropomorphic traits, or to their general movement. All subjects of this stage, however, at least make a mention of autonomous movement." (Laurendeau & Pinard, 1962, p. 147.)

Stage 3: **Total Disappearance of Animistic Thinking.** Subjects in this stage never grant life to inanimate objects, at least to those listed in the Questionnaire. The
reverse of this is not true, that is, Ss often refuse life to some animate objects, especially plants, on the basis of lack of autonomy and for anthropomorphic reasons. Explanations given may be anthropomorphic, or based upon usefulness or activity.

The complete set of instructions given to the judges can be found in Appendix C.

Interjudge reliability of the classification system was estimated by the extent of agreement among the 3 judges as to the stage of animistic thinking reflected in responses. There was perfect agreement in 72% of the cases (43) and ratings within 1 stage of agreement in 28% of the cases (17). There was only 1 case where judges differed by more than 1 stage. These figures indicate the classifying system to be adequate for purposes of this study. The final stage assigned to each S was the mean of the 3 judges' ratings.

Determination of the stages of animism achieved on the Card Sort involved employment of the following criteria.

Stage 0: If an S placed 2 or fewer animate objects in the "alive" category or 4 or fewer inanimate objects in the "not alive" category, then S's sorting was considered random and done without any comprehension of the concept.

Stage 1: An S was placed in the Stage 1 category if he committed one or more errors in the "alive", "autonomous movement", and the "movement" categories. Further, if additional errors were made in the "movement" category but
not in the "autonomous movement" classification, S was judged to be in Stage 1. An error was defined as placing an inanimate object in the animate category.

Stage 2: If the S made one or more errors in the "alive" and the "autonomous movement" categories, he was classified as being in Stage 2. If the same inanimate objects were called both "moving" and "autonomously moving", S was judged to be in this stage. Further, if one or more of the inanimate objects called not alive were put in the "not autonomously moving" category, S was placed in Stage 2.

Stage 3: If no errors were made in the "alive" category, S was placed in Stage 3, regardless of whether errors were made in other sorts.

A comparison of stages reached by the Ss on the Questionnaire and the Card Sort was made by tabulating the frequencies of each occurrence and converting to a proportion of the total cases.

An inspection of the data on the 3 tasks was made to see if animism decreased with increasing concreteness of the stimulus mode.

**Effect of Age and Sex on Animism**

To examine the question of whether there are differences in the amount of animism as a function of age and sex, an analysis of variance using animism scores was calculated for each of the 3 tasks.
Many of the analyses in the present study dealt with the Ss' internal consistency in responding. Because some researchers in the past have utilized a quantitative approach to each item, percentages of animistic errors were tallied for each age level for each inanimate object listed on the Questionnaire, the Card Sort, and the Story Inquiry. This allowed a more direct comparison of the present data with previous findings.

**Analysis of Criteria for Life**

Several content analyses of responses to the Questionnaire and the Story Inquiry were completed to examine the criteria Ss used to attribute life. Another technique related answers to the general items on the Questionnaire to the stage rating achieved.

To permit a visual comparison of the association between aliveness and movement, and between aliveness and autonomous movement, instances of Ss placing inanimate objects of the Card Sort in 8 comparison categories were tallied. The paired-variable groupings included: alive and moving, not alive and not moving, alive and not moving, not alive and moving, alive and autonomously moving, not alive and not autonomously moving, alive and not autonomously moving, and not alive and autonomously moving. The inanimate objects on the Card Sort are listed on page 30. The frequencies were then exhibited by age groups.
RESULTS

Reliability of the Experimental Tasks

In comparing the performance of Ss on 3 tasks, an area of initial importance is that of cross method reliability of individual items. Are there indications that each task was independent of the others? What evidence is there that responses to individual items were sufficiently consistent to warrant judgments concerning the conceptual development of Ss in terms of animism?

An affirmative response to the former question comes from the data concerning the proportion of total Ss calling each of four objects alive across the three tasks. These proportions were analyzed in terms of chi square ($X^2$), the values of which are presented in Table I.

<table>
<thead>
<tr>
<th>Object</th>
<th>$X^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>sun</td>
<td>.59</td>
<td>.80</td>
</tr>
<tr>
<td>clouds</td>
<td>3.25</td>
<td>.20</td>
</tr>
<tr>
<td>tree</td>
<td>2.18</td>
<td>.50</td>
</tr>
<tr>
<td>car</td>
<td>.91</td>
<td>.70</td>
</tr>
</tbody>
</table>
None of the values in Table I reached the level of statistical significance, indicating the differences in the proportion of Ss calling an item alive on one task as compared with either of the other tasks could be attributed to chance. Note that this calculation analyzed a specific characteristic of the objects, i.e., their "aliveness", as opposed to later analyses which deal with response consistency, the extent to which Ss responded similarly to the same items in different contexts regardless of whether they perceived them as "alive" or "not alive".

Two techniques measured consistency of responses to common items across tasks. Tetrachoric correlations, used to estimate intra-subject consistency for items across tasks, are presented in Table II.

As shown in Table II, significant intra-subject response consistency was found for 15 of the 20 items shared by the Questionnaire and the Card Sort. Intra-subject agreement was significant for 5 of the 6 objects common to the Questionnaire and the Story Inquiry and all 6 items appearing jointly on the Story Inquiry and the Card Sort. In general, the tendency of the child to regard an object either animistically or realistically generalized across the methods of presentation.

A more rigorous test of response consistency involved a tabulation of the instances of perfect agreement for
TABLE II

TETRACHORIC CORRELATIONS ($r_t$) FOR COMMON ITEM RESPONSES FOR ALL Ss

<table>
<thead>
<tr>
<th>Item</th>
<th>Questionnaire &amp; Card Sort</th>
<th>Questionnaire &amp; Story Inquiry</th>
<th>Story Inquiry &amp; Card Sort</th>
</tr>
</thead>
<tbody>
<tr>
<td>mountain</td>
<td>.71 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>table</td>
<td>.50 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cat</td>
<td>.79 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lamp</td>
<td>.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bird</td>
<td>.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fly</td>
<td>.52 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>flower</td>
<td>.67 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>watch</td>
<td>.32 *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bell</td>
<td>.54 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>plane</td>
<td>.36 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fire</td>
<td>.37 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rain</td>
<td>.45 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>snake</td>
<td>.41 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fish</td>
<td>.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>child</td>
<td>.66 **</td>
<td>.68 **</td>
<td>.68 **</td>
</tr>
<tr>
<td>dog</td>
<td>.26 *</td>
<td>.15</td>
<td>.33 **</td>
</tr>
<tr>
<td>tree</td>
<td>.36 **</td>
<td>.58 **</td>
<td>.41 **</td>
</tr>
<tr>
<td>sun</td>
<td>.15</td>
<td>.26 *</td>
<td>.36 **</td>
</tr>
<tr>
<td>car</td>
<td>.67 **</td>
<td>.31 *</td>
<td>.46 **</td>
</tr>
<tr>
<td>cloud</td>
<td>.20</td>
<td>.35 **</td>
<td>.57 **</td>
</tr>
</tbody>
</table>

* $p < .05$, df = 58
** $p < .01$, df = 58
items across all 3 tasks. Six items were common to all 3 tasks. Therefore, each S had 6 opportunities to agree perfectly; the total possible instances of agreement for each age group was 120. The proportions and percentages reflecting occurrences of identical intra-subject responding by age groups are shown in Table III.

TABLE III

INSTANCES OF PERFECT INTRA-SUBJECT AGREEMENT FOR COMMON ITEMS ACROSS 3 TASKS BY AGE GROUPS

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Proportion</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-year-olds</td>
<td>44/120</td>
<td>37</td>
</tr>
<tr>
<td>4-year-olds</td>
<td>55/120</td>
<td>46</td>
</tr>
<tr>
<td>5-year-olds</td>
<td>70/120</td>
<td>58</td>
</tr>
</tbody>
</table>

The increase of consistent responding with age indicates that the Ss become more reliable in their responses, and that in each of the 3 tasks common elements were presented, an index of construct validity. For, if the tasks were not measuring a single internalized concept, Ss would have become less consistent as their discriminatory abilities developed with age.

Task Equivalence

Analyses were completed to yield information about the effect of differing stimulus modes on the elicitation of an equivalent class of responses. The 3 tasks
employed in the present study differed in the degree of abstraction of the stimulus presentation. The Questionnaire provided a verbal presentation, the Card Sort a pictorial representation, and the Story Inquiry a three-dimensional model.

Performances on the Questionnaire, the Card Sort, and the Story Inquiry tasks were evaluated to yield an animism score for each. As an indication of the effect of different stimulus modes upon the elicitation of animistic responses, these animism scores were intercorrelated using Pearson's $r$ as shown in Table IV.

<table>
<thead>
<tr>
<th></th>
<th>Questionnaire</th>
<th>Card Sort</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questionnaire</td>
<td>.5292 **</td>
<td></td>
</tr>
<tr>
<td>Story Inquiry</td>
<td>.4109 **</td>
<td>.3995 **</td>
</tr>
</tbody>
</table>

** $p < .01$, df = 58

All three correlations in Table IV are statistically significant. Furthermore, the magnitudes of the intercorrelations indicate that a construct of animism as defined in this study is tenable.

One approach to measuring task equivalence is to focus on the apparent dissimilarities of the three tasks.
To determine whether animism decreased with increasing concreteness of the stimulus form, a tabulation was made of instances where S called an inanimate object alive on the Questionnaire or on the Questionnaire and the Card Sort, but denied it life on the Story Inquiry task. Three-year-olds evidenced this 16 times, 4-year-olds 11 times, and 5-year-olds 13 times. These data are not sufficient to establish a statistical trend, but the small differences with increasing age are in the predicted direction.

In the final test of task equivalence performances on the Questionnaire and the Card Sort were compared. On the basis of responses to items on these 2 tasks, each S was assigned to a "stage" of animism. Stages of animism achieved by Ss on the Questionnaire and the Card Sort were compared by construction of a matrix placing each S on the basis of his rated stage of animism on the Card Sort and the Questionnaire, as shown in Table V.

TABLE V

DISTRIBUTION OF ALL Ss IN EACH STAGE OF ANIMISM ON THE QUESTIONNAIRE AND THE CARD SORT

<table>
<thead>
<tr>
<th>Card Sort</th>
<th>Questionnaire</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stage 0</td>
<td>Stage 1</td>
<td>Stage 2</td>
<td>Stage 3</td>
</tr>
<tr>
<td>Stage 0</td>
<td>10</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stage 1</td>
<td>4</td>
<td>10</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Stage 2</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Stage 3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
Inspection of Table V reveals that 28 Ss achieved identical stages on the 2 tasks. Fifteen Ss were rated higher on the Questionnaire than on the Card Sort, whereas 17 Ss obtained higher ratings on the Card Sort than on the Questionnaire. Of the Ss placed in a different stage on the 2 tasks, about half of these were rated higher on the Card Sort, and half higher on the Questionnaire, indicating measurement error, but not bias. That half of the total Ss were rated at the same stage on both tasks provides additional evidence that the construct of animism as defined in this study was being reliably measured across tasks.

Animism as a Function of Age and Sex

To examine the question of whether there are differences in the amount of animism as a function of age and sex, a 2 X 6 analysis of variance was calculated for each task using animism scores. A significant age effect was obtained as shown in Tables VI, VII, and VIII.

TABLE VI
2 X 6 ANALYSIS OF VARIANCE SUMMARY TABLE FOR THE QUESTIONNAIRE TASK

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>590.80</td>
<td>5</td>
<td>101.96</td>
<td>4.45</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Sex</td>
<td>8.06</td>
<td>1</td>
<td>8.06</td>
<td>.35</td>
<td></td>
</tr>
<tr>
<td>Interaction</td>
<td>65.94</td>
<td>5</td>
<td>13.19</td>
<td>.58</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td>1099.60</td>
<td>48</td>
<td>22.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1764.40</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE VII

2 X 6 ANALYSIS OF VARIANCE SUMMARY
TABLE FOR THE CARD SORT TASK

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1026.28</td>
<td>5</td>
<td>205.26</td>
<td>6.09</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Sex</td>
<td>30.81</td>
<td>1</td>
<td>30.81</td>
<td>.91</td>
<td></td>
</tr>
<tr>
<td>Interaction</td>
<td>364.69</td>
<td>5</td>
<td>72.94</td>
<td>2.16</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td>1618.80</td>
<td>48</td>
<td>33.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3040.58</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TABLE VIII

2 X 6 ANALYSIS OF VARIANCE SUMMARY
TABLE FOR THE STORY INQUIRY TASK

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>304.68</td>
<td>5</td>
<td>60.97</td>
<td>3.77</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Sex</td>
<td>.81</td>
<td>1</td>
<td>.81</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>Interaction</td>
<td>90.69</td>
<td>5</td>
<td>18.19</td>
<td>1.12</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td>776.40</td>
<td>48</td>
<td>16.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1172.58</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
To provide information on individual items, animistic errors were tallied for each age level and for each inanimate object listed on the 3 tasks, as presented in Tables IX, X, and XI.

### TABLE IX
PERCENTAGE OF ANIMISTIC ERRORS FOR EACH AGE LEVEL AND FOR EACH INANIMATE OBJECT LISTED ON THE QUESTIONNAIRE

<table>
<thead>
<tr>
<th>Item</th>
<th>3-year-olds</th>
<th>4-year-olds</th>
<th>5-year-olds</th>
<th>Mean %</th>
</tr>
</thead>
<tbody>
<tr>
<td>wind</td>
<td>85</td>
<td>55</td>
<td>40</td>
<td>60.0</td>
</tr>
<tr>
<td>cloud</td>
<td>85</td>
<td>50</td>
<td>35</td>
<td>56.7</td>
</tr>
<tr>
<td>bell</td>
<td>75</td>
<td>45</td>
<td>35</td>
<td>51.7</td>
</tr>
<tr>
<td>airplane</td>
<td>80</td>
<td>40</td>
<td>30</td>
<td>50.0</td>
</tr>
<tr>
<td>fire</td>
<td>70</td>
<td>45</td>
<td>35</td>
<td>50.0</td>
</tr>
<tr>
<td>sun</td>
<td>65</td>
<td>45</td>
<td>35</td>
<td>48.3</td>
</tr>
<tr>
<td>rain</td>
<td>70</td>
<td>40</td>
<td>35</td>
<td>48.3</td>
</tr>
<tr>
<td>car</td>
<td>70</td>
<td>45</td>
<td>20</td>
<td>45.0</td>
</tr>
<tr>
<td>mountain</td>
<td>80</td>
<td>40</td>
<td>5</td>
<td>41.7</td>
</tr>
<tr>
<td>watch</td>
<td>65</td>
<td>40</td>
<td>20</td>
<td>41.7</td>
</tr>
<tr>
<td>bicycle</td>
<td>75</td>
<td>40</td>
<td>10</td>
<td>41.7</td>
</tr>
<tr>
<td>pencil</td>
<td>85</td>
<td>35</td>
<td>5</td>
<td>41.7</td>
</tr>
<tr>
<td>lamp</td>
<td>70</td>
<td>40</td>
<td>10</td>
<td>40.0</td>
</tr>
<tr>
<td>table</td>
<td>70</td>
<td>40</td>
<td>5</td>
<td>38.3</td>
</tr>
<tr>
<td>range</td>
<td>65-85</td>
<td>35-55</td>
<td>5-40</td>
<td>38.3-60.0</td>
</tr>
</tbody>
</table>
TABLE X
PERCENTAGE OF ANIMISTIC ERRORS FOR EACH AGE LEVEL
AND FOR EACH INANIMATE OBJECT LISTED ON THE CARD SORT

<table>
<thead>
<tr>
<th>Item</th>
<th>3-year-olds</th>
<th>4-year-olds</th>
<th>5-year-olds</th>
<th>Mean %</th>
</tr>
</thead>
<tbody>
<tr>
<td>rain</td>
<td>60</td>
<td>55</td>
<td>30</td>
<td>48.3</td>
</tr>
<tr>
<td>airplane</td>
<td>70</td>
<td>45</td>
<td>25</td>
<td>46.7</td>
</tr>
<tr>
<td>jack-in-box</td>
<td>75</td>
<td>35</td>
<td>25</td>
<td>45.0</td>
</tr>
<tr>
<td>sun</td>
<td>55</td>
<td>50</td>
<td>30</td>
<td>45.0</td>
</tr>
<tr>
<td>smoke</td>
<td>70</td>
<td>30</td>
<td>30</td>
<td>43.3</td>
</tr>
<tr>
<td>doll</td>
<td>65</td>
<td>40</td>
<td>25</td>
<td>43.3</td>
</tr>
<tr>
<td>cloud</td>
<td>50</td>
<td>40</td>
<td>40</td>
<td>43.3</td>
</tr>
<tr>
<td>motorcycle</td>
<td>65</td>
<td>40</td>
<td>20</td>
<td>41.7</td>
</tr>
<tr>
<td>fire</td>
<td>65</td>
<td>30</td>
<td>30</td>
<td>41.7</td>
</tr>
<tr>
<td>watch</td>
<td>55</td>
<td>45</td>
<td>25</td>
<td>41.7</td>
</tr>
<tr>
<td>broken tricycle</td>
<td>60</td>
<td>45</td>
<td>15</td>
<td>40.0</td>
</tr>
<tr>
<td>T.V.</td>
<td>65</td>
<td>35</td>
<td>20</td>
<td>40.0</td>
</tr>
<tr>
<td>car</td>
<td>65</td>
<td>35</td>
<td>20</td>
<td>40.0</td>
</tr>
<tr>
<td>lamp</td>
<td>60</td>
<td>45</td>
<td>10</td>
<td>38.3</td>
</tr>
<tr>
<td>bell</td>
<td>60</td>
<td>30</td>
<td>20</td>
<td>36.7</td>
</tr>
<tr>
<td>knife</td>
<td>55</td>
<td>35</td>
<td>20</td>
<td>36.7</td>
</tr>
<tr>
<td>broken dish</td>
<td>60</td>
<td>35</td>
<td>10</td>
<td>35.0</td>
</tr>
<tr>
<td>table</td>
<td>60</td>
<td>30</td>
<td>15</td>
<td>35.0</td>
</tr>
<tr>
<td>mountain</td>
<td>60</td>
<td>40</td>
<td>5</td>
<td>35.0</td>
</tr>
<tr>
<td>broken pencil</td>
<td>60</td>
<td>25</td>
<td>15</td>
<td>33.3</td>
</tr>
<tr>
<td>crayon</td>
<td>45</td>
<td>40</td>
<td>10</td>
<td>31.7</td>
</tr>
<tr>
<td>broken glasses</td>
<td>60</td>
<td>20</td>
<td>10</td>
<td>30.0</td>
</tr>
</tbody>
</table>

range 45-75 20-55 5-40 30.0-48.3
TABLE XI

PERCENTAGE OF ANIMISTIC ERRORS FOR EACH AGE LEVEL AND FOR EACH INANIMATE OBJECT LISTED ON THE STORY INQUIRY

<table>
<thead>
<tr>
<th>Item</th>
<th>Age 3-year-olds</th>
<th>Age 4-year-olds</th>
<th>Age 5-year-olds</th>
<th>Mean %</th>
</tr>
</thead>
<tbody>
<tr>
<td>sun</td>
<td>65</td>
<td>50</td>
<td>35</td>
<td>50.0</td>
</tr>
<tr>
<td>car</td>
<td>75</td>
<td>40</td>
<td>30</td>
<td>48.3</td>
</tr>
<tr>
<td>clouds</td>
<td>60</td>
<td>40</td>
<td>30</td>
<td>43.3</td>
</tr>
<tr>
<td>range</td>
<td>60-75</td>
<td>40-50</td>
<td>30-35</td>
<td>43.3-50.0</td>
</tr>
</tbody>
</table>

These data indicate that the tendency to attribute life to an inanimate object decreases consistently with age for all 3 tasks. The percentages indicate that the younger children made more animistic errors than did older children. The age trend was more clearly seen on the Questionnaire than on the Card Sort or the Story Inquiry, supporting the evidence reported earlier that animism decreases slightly with increasing stimulus concreteness.

A comparison of the ranks of the mean percentages of Questionnaire objects in Table IX with similar data from Laurendeau and Pinard's (1962) study of the same items revealed a statistically significant correlation (rho = .8652, p < .005, df = 12). Laurendeau and Pinard's
Criteria for Life

The purpose of this section is to elucidate evidence regarding criteria Ss used to decide whether an object was alive or not alive.

Before focusing on the criteria for life used by Ss, the characteristic responses of Ss at various stages of animistic thinking will be summarized. Responses to the general questioning of the Questionnaire for Ss at various rated stages of animism on the Questionnaire were examined. A majority of Ss categorized as being in Stage 0 answered the questions with irrelevant remarks, or said "I don't know". An example is "What does it mean (to be alive)?" "Bathing suits." "Give me the name of some things which are alive." "Houses, paper." This S proceeded to say that an object was alive because it "likes to be alive."

Most Ss in Stages 1, 2, and 3 said they did not know what it meant to be alive. However, they responded correctly when asked to name some things which were living. Table XII indicates the number of Ss in each stage responding to the general questioning in each of 5 ways.

Table XII reveals that although there is some correspondence between a S's ability to give a reasonably
TABLE XII
FREEQUENCY OF Ss IN EACH STAGE RESPONDING TO THE GENERAL QUESTIONS OF THE QUESTIONNAIRE IN FIVE CLASSIFIABLE WAYS

<table>
<thead>
<tr>
<th>Stages</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>No comprehension</td>
<td>9</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Replied &quot;I don't know&quot;* but named inanimate objects **</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Replied &quot;I don't know&quot;* but named both inanimate and animate objects **</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Replied &quot;I don't know&quot;* but named animate objects **</td>
<td>6</td>
<td>12</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Gave a reasonably correct explanation +</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

* to the questions "Do you know what it is to be alive, to be living?" and "What does it mean?"

** when asked "Give me the name of some things which are alive."

+ "reasonably correct explanation" included mention of any of the biological traits of aliveness, such as "eats", "grows", etc.
correct explanation of what it means to be alive and his actual attribution of aliveness to objects, caution is needed in seeking clues to cognitive development in young children.

Several examinations of the data were made to investigate what criteria Ss used in attributing life. An inspection of the response content to the test items of the Questionnaire provided some insight into the hypothetical rationales Ss utilized in making their decisions. Protocols were categorized as being primarily in one of three groups: (1) no comprehension, (2) use of superficial characteristics of the object, and (3) use of a functional characteristic. The frequencies by age groups for each of these groupings are shown in Table XIII.

### TABLE XIII

**FREQUENCIES BY AGE GROUP OF QUESTIONNAIRE PROTOCOLS IN EACH OF THREE GROUPINGS WITH REGARD TO RATIONALE CONTENT**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>No Comprehension</th>
<th>Superficial Characteristics</th>
<th>Functional Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-year-olds</td>
<td>11</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>4-year-olds</td>
<td>4</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>5-year-olds</td>
<td>2</td>
<td>0</td>
<td>17</td>
</tr>
</tbody>
</table>

Two of the protocols exhibited approximately equal portions of 2 or more groupings and thus were not
included in Table XIII. Very few of the protocols were entirely within the definition of one grouping. However, the majority of responses in each protocol used 1 type of rationale.

In the No Comprehension group some of the Ss said "I don't know" or refused to answer. Other responses placed in this category included "because it likes to be alive", and "because my mom said (it is alive)."

As can be seen in Table XIII, few Ss utilized the superficial characteristics of an object to decide if it was alive or not. This category included such responses as "it has no feet", "because it is out there", and "because it is yellow". Another type of response given several times appears to be superficial: "when we open a light it is alive and when we close it, it's not alive". This S is exhibiting the idea that movement is crucial; when something is moving (or is performing a function) it is alive (of value to us), but when it is not moving or performing a useful function it is not alive. This reasoning, in the Piagetian view, arises from the egocentricity of the child's thinking. He is the center of the universe and all other objects are there to serve him.

Included in the functional grouping of responses to the question "why do you say it is alive?" are comments on the moral as well as physical attributes of objects. Examples of this type of reasoning are "because it can
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Included in the functional grouping of responses to the question "why do you say it is alive?" are comments on the moral as well as physical attributes of objects. Examples of this type of reasoning are "because it can
fly", "because it can rain-drop", "because people can go
up the mountain", and "because it can snap you". Again,
in this group we see responses indicating that the value of
an object can determine its aliveness.

Frequently an S using functional characteristics for
most items would refer to superficial characteristics in
attributing life to a few objects. S #37 said the bell
was alive "because it rings", the airplane, "because it
flies in the sky", the tree, "because it has a stem like
this (gesturing)", and the mountain, "because it has lots
of dirt". Other children used relevant functions of
objects to attribute life and employed superficial charac-
teristics of other objects in explaining why they were
not alive. S #47, for example, said a bird was alive
"because it can fly", whereas a tree was not alive "because
it has leaves on it" and a mountain was not "because there's
dirt on it".

Another S imparted "will" and a sense of freedom to
objects: many things were called alive because they "can
go wherever they want to" or "you can ride them wherever
you want to".

For some older Ss, having a function is necessary but
not sufficient for life. Subjects often discriminated
among possible functions, accepting some and discarding
others as criteria for granting aliveness. One S said a
tree was alive "because it grows", whereas the wind is
not alive "because it's just wind... it blows". This same S said a bird is alive because "it brings good luck".

Even though responses to the Questionnaire items lent themselves to a degree of content categorization, this author is still impressed with the highly individualistic rationales Ss utilized in the attribution or denial of life.

Further evidence regarding the basis for animism comes from an analysis of responses to the Story Inquiry items. Piaget said that children consider objects to act intentionally. Objects on the Story Inquiry which elicited 53 responses indicating intentional activity also obtained 39 responses indicating attribution of life. The older Ss showed a marked decrease in the tendency to call an action intentional, correctly perceiving the stories as depicting accidental situations. It is interesting to note, however, that 55 Ss attributed blame or fault at least once in the 3 stories. Many of the younger Ss found both participants at fault. Likewise, Ss of all ages stated that punishment should be administered in 85 instances, 57 of these involving objects which the S also called alive on the same task. Only 14 Ss who laid blame for an action failed to indicate punishment was in order in at least 1 of the stories. So, it seems that regardless of whether an object acted intentionally, punishment for the deed was often called for, even by the older Ss.
After indicating that one of the inanimate objects "knew" what had happened in a story, many of the younger Ss responded to the additional query with a comment on the function of that object. For example, when asked how the sun felt about what had happened, one S replied "it burns you". Older Ss were able to speak in terms of emotion, such as "feels mad", or "feels badly", or "he's sad".

To focus on a specific hypothetical criterion Ss might use to attribute life, the Card Sort data were analyzed in several ways. The association between movement and aliveness was evaluated by tabulating instances where Ss attributed both movement and aliveness to 22 inanimate Card Sort items. Also tallied were occurrences of an item being labeled "alive and no movement", "not alive and no movement", and "not alive and movement". The percentages of each type of occurrence are presented by age group in Figure 1.

It is evident from Figure 1 that 3-year-olds called more inanimate objects alive, regardless of whether movement was also attributed. With increasing age there was a decreasing tendency to call something alive unless it also moved. However, Ss were more likely, with increasing age, to attribute movement but not aliveness to inanimate objects. The picture of this phenomenon is remarkably clear: movement appears to serve as one criterion of
Figure 1. Percentages by age groups of placement of 22 inanimate Card Sort objects into the categories of Alive-Movement (A-M), not Alive-no Movement (not A-no M), Alive-no Movement (A-no M), and not Alive-Movement (not A-M).
aliveness for younger Ss, but is a less critical determinant for older Ss.

Four of the 22 inanimate objects on the Card Sort were broken or smashed. These items were the dish, tricycle, glasses, and pencil, and were included in the task to test an hypothesis of differential responding to these items as compared with objects in good physical condition. The percentage of Ss by age group placing broken objects as opposed to non-broken objects in the combinations of the alive and movement categories are presented in Table XIV.

<table>
<thead>
<tr>
<th>Category Pair</th>
<th>Age Groups</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3-year-olds</td>
<td>4-year-olds</td>
<td>5-year-olds</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Objects</td>
<td>Objects</td>
<td>Objects</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Broken</td>
<td>Non-Broken</td>
<td>Broken</td>
<td>Non-Broken</td>
<td></td>
</tr>
<tr>
<td>Alive-Movement</td>
<td>30</td>
<td>37</td>
<td>7</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>Not Alive-No Movement</td>
<td>31</td>
<td>24</td>
<td>54</td>
<td>39</td>
<td>75</td>
</tr>
<tr>
<td>Alive-No Movement</td>
<td>30</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>10</td>
</tr>
<tr>
<td>Not Alive-Movement</td>
<td>9</td>
<td>14</td>
<td>15</td>
<td>22</td>
<td>13</td>
</tr>
</tbody>
</table>
Table XIV reveals that the joint attribution of not alive-no movement was strikingly differential for broken objects as compared to intact objects. Although the difference is small with the 3-year-olds, 4-and especially 5-year-olds demonstrated a marked tendency to identify the broken objects as unable to move and not alive.

With the exception of analyses dealing with intra-subject consistency, little has been reported to this point about Ss' performance on items presenting living objects. The Card Sort data is representative of the way Ss perceived animate objects as tested in the present study.

Performances of Ss with regard to the 9 animate objects on the Card Sort in relation to aliveness and movement are presented in Table XV.

**TABLE XV**

<table>
<thead>
<tr>
<th>Category Pair</th>
<th>Age Group</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3-year-olds</td>
<td>4-year-olds</td>
<td>5-year-olds</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Freq.</td>
<td>%</td>
<td>Freq.</td>
<td>%</td>
<td>Freq.</td>
</tr>
<tr>
<td>Alive-Movement</td>
<td>98</td>
<td>54</td>
<td>118</td>
<td>66</td>
<td>128</td>
</tr>
<tr>
<td>Not Alive-No Movement</td>
<td>17</td>
<td>9</td>
<td>20</td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td>Alive-No Movement</td>
<td>23</td>
<td>13</td>
<td>26</td>
<td>14</td>
<td>24</td>
</tr>
<tr>
<td>Not Alive-Movement</td>
<td>42</td>
<td>23</td>
<td>16</td>
<td>9</td>
<td>12</td>
</tr>
</tbody>
</table>
These data indicate that with increasing age there developed an improved ability to correctly discriminate animate objects as being alive and capable of movement. With increasing age is also seen a declining in responses labeling something not alive that was perceived as able to move. The joint category of not alive-no movement is of special interest: 47 out of 53 responses from all $S$s in this category dealt with the flower or the tree. In general, the picture is reversed for animate and inanimate objects: there was a decreasing tendency with age to call an inanimate object alive and capable of movement, whereas there was an increasing tendency to attribute life and movement to animate objects. And, more $S$s, with increasing age, attributed movement but not life to non-living objects, but reversed this tendency for animate objects.

A final analysis of the Card Sort data was completed to examine whether there was a greater association between aliveness and autonomous movement as opposed to aliveness and movement, regardless of the source. Figure 2 presents the placement of 22 inanimate Card Sort objects for the categories of autonomous movement and aliveness. Separating the data by age groups enables an inspection of the effect of age on this association. Figure 2 shows that 3-year-olds associated aliveness with autonomous movement to a remarkable degree. In part, this association may be attributed to the positive response sets manifested
Figure 2. Percentages by age groups of placement of 22 inanimate Card Sort objects into the categories of Alive-Autonomous Movement (A-AM), not Alive-no Autonomous Movement (not A-no AM), Alive-no Autonomous Movement (A-no AM), and not Alive-Autonomous Movement (not A-AM).
by at least 3 Ss. A more meaningful distribution is found among the 4- and 5-year olds. The first 2 bars of each age group indicate a substantial amount of association between aliveness and autonomous movement. The last bar, that of "not alive-autonomous movement" is somewhat surprising. This suggests Ss might be willing to attribute life-like qualities to objects but would stop short of attributing life itself. This, of course, is also true of adults: witness our use of animism by poetic license in everyday speech. A comparison of Figures 1 and 2 indicates that, with increasing age, the changes in frequencies of all categories are in the same direction. That is, there is a decreasing tendency to attribute life to an inanimate object unless it is additionally capable of movement or autonomous movement. At the same time, however, Ss exhibit an increasing willingness to grant movement of either kind without also attributing life.
DISCUSSION

Investigations into the nature of the child's conception of aliveness have raised a number of issues. Among the debated topics are (1) the reality of the concept of animism: is the thinking of the child qualitatively different from that of the adult?, (2) the stage concept: does the development of non-animistic thought occur in a series of recognizable stages?, (3) task equivalence: is animism merely an artifact of the experimental situation typically used for its measurement?, (4) evidence regarding the existence of animism: what behaviors constitute animism? What effect does grouped as opposed to individual item analysis have on the amount of animism judged to be present?, and (5) the basis of animism: what attributes does the child use in designating animate and inanimate objects alive or not alive?

The present study has provided information on each of these issues. The discussion which follows involves an overlapping of issues and evidence as each topic is interwoven with the others.

Animism as a Construct

One line of thinking about animism, following Piaget's original formulation, regards animistic thinking as a
useful description of a process of cognitive development. The other, proposed by Huang and others, maintains that there is no unique state of precausal thinking in the young child. The Piagetian regards the young child as fusing the two worlds of himself and external reality, resulting in total egocentrism. Gradually, the characteristics of these two worlds become differentiated and notions about each develop which replace earlier thoughts. Thus, child thought is seen to be qualitatively different from that of the adult.

Those opposing the reality of animism hold that instead of an elaborate set of precausal ideation, a neutral or undetermined state exists, characterized by a lack of ideas about the nature of the self or the world. Then gradually, as more information is accumulated, the child approaches adult thought, a quantitative process (Huang, 1943; Klingberg, 1957). In support of the notion of the existence of a state of ignorance, Huang (1943) claimed that young children answer at random and frequently change their responses when new suggestions are made.

The present study provides information on both qualitative and quantitative differences with age. In general, quantitative measures include numerical tabulation of animistic errors, i.e., attributing life to inanimate objects. Qualitative indices involve the reasoning
behind such decisions, the ideational process underlying the labeling of objects as alive or not alive.

Although the current research did not directly compare child and adult thinking, age trends were found that could be theoretically extrapolated. Support for extrapolation is provided by significant correlations between rankings of identical Questionnaire items used in this research and Laurendeau and Pinard's (1962) study with Ss through 12 years of age.

Analyses indicating quantitative differences among Ss in the current research utilized the frequencies of animistic errors by age groups for individual items, and within each of the three tasks.

Both measures showed decreases in animism with increasing age. The tabulation of animistic errors for individual items on each of the three tasks revealed that 3-year-olds consistently called more inanimate objects alive more often than 4-or 5-year-olds. Huang and other opponents of the precausality notion have reported that individual item analysis failed to exhibit signs of animism. Their analysis was conducted in a manner similar to the individual item analyses carried out in the present study. The ranges of animistic errors for Ss in this research show that every age group called each inanimate object alive some of the time. The percentages for the 3-year-olds were higher than the 4-and 5-year-
olds on all three tasks. The evidence suggests some animistic thinking is present at all age levels sampled.

The second quantitative measure employed animism scores assigned to Ss for each of the three tasks. Analyses of variance using these scores indicated that age was the only significant factor in accounting for differences in performances on each of the three tasks. The finding of no differential response between boys and girls is in agreement with previous studies (Russell, 1940a).

Qualitative differences are exhibited in the rationales Ss used to call inanimate objects alive. In general, younger Ss often relied on capricious reasons while older Ss developed an awareness of the movement of objects and, further, of autonomous energy. At the oldest age levels in this study there is evidence of the beginning of an adult biological definition of life, such as "it breathes, eats", etc.

Qualitative differences over age were indicated by the stages of animism assigned on the basis of Questionnaire and Card Sort data. Stages for the Questionnaire were assigned by a standardized qualitative analysis of response content. As might be expected, higher cognitive levels were found more frequently for older children.

Other qualitative differences were shown by the kinds of object characteristics mentioned by the child. With increasing age fewer Ss used capricious reasons or
superficial characteristics to label an object alive, whereas the use of functional characteristics increased.

Analyses of the Story Inquiry data indicated younger Ss attributed intention to objects more often than older Ss, sometimes blaming both participants of the story. This supports Piaget's theory of egocentricism, whereby the young child cannot conceive of unconscious action.

Age differences were found in the association of aliveness and movement, determined by performance on the Card Sort. There is a decreasing tendency to attribute life to an inanimate object unless it is additionally capable of movement. At the same time, however, Ss exhibit an increasing willingness to grant movement without also attributing life.

Both quantitative and qualitative measures strengthened the notion that fewer inanimate objects are called alive with increasing age, an hypothesis generally supported by all previous investigations regardless of theoretical persuasion of the experimenter. Characteristics of objects which young children initially used in decision making changed with increasing age. This change was such that the two characteristics could not be simultaneously applied, thus a qualitative shift had occurred.

The picture of the young child's mind existing in ignorance or in a void of some type fails to provide a useful alternative to Piaget's theory of indifferentiation,
as pointed out by Jahoda (1958a). Although both quantitative and qualitative change theories are tenable, looking at the "why's" of the child's responses appears more productive in analyzing the process of cognitive development.

**The Stage Concept**

Pertinent to the above discussion of qualitative and quantitative differences between child and adult thought is the notion of stages as descriptive of the growth process. Theories which deny the existence of animistic thought contend that children progress from a state of relative ignorance to one of better and better knowledge. Empirical proof for this incremental process seems out of reach. The positive view of animism hypothesizes that growth occurs in recognizable stages, each stage being a transformation of previous stages rather than a simple incorporation of additional concepts.

Information gained from the perspective of direct observation of children enabled Piaget to categorize the development of the concept of aliveness into four stages. These were redefined by Laurendeau and Pinard (1962) and their stages were employed in the present study. Stage 0 includes Ss who show no comprehension of the concept for various reasons. Stage 1 Ss appear to use such criteria as whether an object is in good condition, can be used for some purpose, is capable of movement, or has some traits typically associated with humans. Stage 2 is one of transition, where Ss employ the idea of autonomous
movement as the criterial variable. Stage 3 is marked by the total disappearance of animistic thought, where no inanimate objects are called alive.

Included in the theory that questions the existence of animism is the challenge that if it does indeed exist, then all 3-year-old children should exhibit signs of being completely animistic, that is, calling all inanimate objects alive all of the time. If this does not occur, according to this line of reasoning, then the existence of animistic thought has not been proven. This theoretical stance seems untenable. Although Piaget set age ranges for his stages of animism, he carefully noted that these were approximations only, that not all 3 year-olds necessarily would be in Stage 0 or 1. Stages of physical development certainly do not occur at the same time for every child. Piaget would hypothesize, however, that each child goes through the stages of animism sequentially, albeit at varying speeds as compared with other children.

In the present study Ss were classified into one of four stages of animism on the basis of Questionnaire data. Further, reasonable correspondence was achieved between rated stages on the Questionnaire and on the Card Sort, the classification system being applied to that task as well. Although longitudinal studies involving repeated measurement of the same S over time would provide conclusive evidence regarding sequential constancy of stages, the present study found that the
frequency of Ss in the higher stages of animism increased with age.

An indication of the validity of the stages in terms of a more general concept of aliveness was demonstrated in relating performance on the general questioning of the Questionnaire task to the rated stage of animism. A majority of the Ss were unable to give an explanation of what it meant to be alive, but correctly named some things that were alive. Of this group of Ss, most were classified in Stages 1, 2, or 3. It appears, therefore, that the ability to express a general concept of what it is to be alive seldom occurs before age 6. However, the results do not mean that all children below this are uniformly animistic or non-animistic. Rather, there occur gradations of response patterns reflecting specific levels of cognitive operation definable by criteria peculiar to each stage.

Incremental growth could be described as the incorporation of "bits" of information much like computer theory (Safier, 1964). These "bits", presumably, would be specific instances, such as "a chair is not alive". Anything more generalizable would approach a stage theory, where concept formation would be described as the vehicle of change. Therefore, if growth were incremental, the possibility of being able to reliably classify 60 Ss into four stages of animism characterized by specific criteria, but not specific instances, would seem to be remote. In
sum, evidence from the present study would support the developmental sequence of discrete stages as being the most parsimonious explanation of behavior at this point in the investigation of animism.

**Task Equivalence**

Some investigators have argued that the concept of animism is not useful in describing cognitive growth. They claim that the artificial nature of the experimental situation typically used to measure animism has instead created the tendency for young children to give non-naturalistic answers. The Questionnaire technique employed by Piaget has been criticized by Huang and others on the ground that verbal techniques used with young children are difficult to evaluate. The latter researchers argue that if enough leading questions are pursued, a child is likely to give some animistic answers.

In order to test the validity of this argument, three tasks were employed in the present study; one of these was the standardized verbal questionnaire test. Two additional tests were used that dealt with many of the same items in more concrete forms. In all three tasks the $S$ was asked "Is the _____ alive?", thus controlling the semantic factor discussed by Looft and Bartz (1969). It was hypothesized that as an object changes from verbal, to pictorial, to life-like model presentations, one could safely assume that the child would share an increased knowledge of the object. Therefore, if children exhibit
marked animism on the Questionnaire (verbal stimuli) but less on the Card Sort (pictorial presentations), and even less on a Story Inquiry task (life-like models), then the claim of Huang and associates that animism is but an artifact of the experimental situation would be supported.

The present study revealed a moderate degree of consistency of responses to identical objects presented in three forms. Animism scores for each task were positively correlated, and there was significant intra-subject agreement on a majority of items across paired tasks. There was no difference in the proportion of total Ss calling each of four objects alive on all three tasks, indicating task equivalence. Furthermore, classification of Ss on Questionnaire protocols into one of four stages of animism were found to be closely related to the stages in which they were placed on the Card Sort task. Finally, the impression of the writer confirms the statistical findings. The writer was continually impressed with the strength of the child's convictions; each S conveyed an individualistic opinion about the life of objects and held to it doggedly across all three experimental tasks. Admittedly, there was no direct attempt to persuade Ss to change their opinions. However, if responses had been random or without adherence to a general conceptual framework, it would seem that the repeated question "Is the ____
alive?" would have yielded markedly different results over the three tasks.

Two sources of evidence from the current research supported the contention that verbal presentation of the stimuli contributes to the presence of animism. The first involves analyzing the effect the degree of abstraction of the stimuli had on the elicitation of animistic responses. More 3-year-olds than 4- or 5-year-olds called an inanimate object "alive" on the Questionnaire and then denied life to the same object on the Card Sort and/or the Story Inquiry. The frequency differences by age groups were not statistically significant, but the trend was in the expected direction, i.e., the concreteness of the stimulus form appeared to have a differential effect for younger Ss.

One other finding lends credence to the assertion that verbal presentation of the stimuli facilitates animism. The frequencies of Ss calling individual objects "alive" on the Questionnaire (verbal) task were slightly higher than the frequencies for the Card Sort (pictorial) and the Story Inquiry (model presentation). This was true especially for the 3-year-olds, although, again, the difference is not statistically significant.

From the accumulation of data in the present study it would appear that little difference in the manifestation of animism could be attributed to differences in
stimulus presentation, provided other variables of the experimental situation are held constant.

**What Constitutes Animism?**

Several decisions face the experimenter in the investigation of animism. These include deciding what behaviors constitute the expression of animism and how to analyze these behaviors once the research is completed. The former involves the operational definition of animism, a major source of disagreement as illustrated in an earlier section of this paper. Huang (1943) and Klingberg (1957) have attacked those who would include such complicated concepts as growth, birth, reproduction, metabolism, and moral conscience in the child's attribution of "life" to an inanimate object. Although the semantic problem of what the question "Is the ____ alive?" actually means was not directly tested in the present research, data from the Story Inquiry task contributes some insight into related concepts, such as intention of action, feelings of guilt, the attribution of blame, and the need for punishment. Generally, the data indicated that for inanimate objects called "alive" there was a tendency to also attribute intention, blame, and the need for punishment. These trends were not statistically evaluated and the frequencies of each, except for the need for punishment, were higher among the younger Ss. Feelings of guilt or upset were found with the older Ss, the younger Ss frequently describing a characteristic of the object
rather than conveying a feeling tone. Therefore, although the data from the current study is inconclusive, it does appear that some of the composite traits of "aliveness" are included in the child's concept of life.

The methods of data analysis have led to confusion in comparing the results of several studies of animism. Previous studies substantiating the presence of animism have analyzed results in terms of the number of $S$s exhibiting at least one animistic response during the experimental procedure (grouped data). Investigators embracing the view that there is not a reliably different process operating in children have utilized individual data analysis, whereby each item is scored in terms of the number of children reacting animistically to it. The problem thus appears one of measuring internal animistic consistency within $S$s or within items. In addition, there is the problem of deciding "how many" non-naturalistic responses must be observed, regardless of the manner in which it is measured, to constitute animism. These decisions appeared to have been answered in previous research according to theoretical persuasion; the present study utilized both methods of analyzing the data.

Intra-subject consistency for animism was exhibited in the reliable classification of $S$s into four stages of animism on the basis of Questionnaire data. This consistency within $S$s across tasks is expressed in the intercorrelations of animism scores for the three tasks
and the moderate degree of correspondence between stages assigned on the Questionnaire and the Card Sort.

Analyzing responses to individual items on each of the three tasks revealed that the average percentages of Ss calling inanimate objects alive ranged from 30% to 60%. The question then becomes one of setting a cut-off point, e.g., all items being called alive at least 50% of the time should be evidence of animism. Huang and his associates interpreted Piaget's theory as meaning that 100% of the children in the first stage of animism would call 100% of the inanimate objects alive 100% of the time. As discussed in an earlier paragraph, this was a misinterpretation of the theory. Therefore, when Huang and other opponents of the precausal notion reported that their research failed to substantiate the existence of animism, the above criteria were being employed.

Experience gained from the present research revealed that Ss in the same stage of animism would call different inanimate objects alive and for different reasons, although the general rationale expressed was similar as defined by the criteria for that particular stage. For that reason, individual item analysis would have an attenuating statistical effect and create a tendency to ignore the basis for the behavior.

The Basis of Animism

Beyond the methodological considerations discussed above lies the theoretical schema of "aliveness" for
the child: what criteria serve to discriminate between objects called alive and not alive?

The developmental sequence of these criteria are reflected in the stages of animism. To investigate whether physical characteristics of objects determined their "aliveness", the Questionnaire protocols were grouped into three categories on the basis of the characteristics of the objects used by the Ss. Excluding the Ss who exhibited no comprehension of the concept, it was found that only a few Ss used superficial characteristics of the objects and most employed functional traits in making their decisions. For younger Ss, movement was found to be important, as was the service value of an object to people, and whether it was in usable condition. Older Ss discriminated between functions, accepting some and rejecting others as prerequisite for life. Data from the Card Sort task indicated that older Ss more easily identified broken items as not capable of movement and not alive. This is in agreement with the notion that children discriminate between damaged and whole objects in attributing life (Russell & Dennis, 1939).

The stages of animism described by Laurendeau and Pinard (1962) hypothesize movement as a criterial variable for assessing aliveness. The Card Sort task in the present study was designed to ascertain the association between movement and aliveness. The results indicated a close relationship between the ability of an object to
move and the probability that it would be called alive. It is interesting to note that older Ss were more willing than younger Ss to grant movement to objects correctly labeled not alive. Trends in the same direction were found for the categories of autonomous movement and aliveness. It is impossible to tell whether the tendency to attribute autonomous movement but not life to inanimate objects is expressing the beginning of poetic license as used by adults, the lack of understanding by the Ss of autonomous movement as expressed in the task, or the lack of relationship between autonomous movement and aliveness for the Ss.

Further clues regarding the concept of life are expressed in Ss' performance on Card Sort items depicting animate objects. Subjects characterized by animism stage as being non-animistic continued to deny life to some living objects, particularly the tree and flower. These results substantiate earlier findings that plant life is often called "not alive" because of the absence of anthropomorphic traits (Laurendeau & Pinard, 1962; Huang & Lee, 1945).

Evidence from the present study substantiate earlier theoretical schemas regarding the basis of animism set forth by Piaget and his supporters. Young children appear to place central value on the ability of an object to perform a function in discriminating between "alive" and "not alive". In performing a function an object is
usually perceived as capable of movement, either imparted or autonomous. The criteria may appear blended with one another and employed interchangably as the child approaches the concept of living held by educated adults of his society. And yet, although the total process may seem to be a blending of criteria, most Ss in the current research utilized one predominant criterion for most items. It is interesting to note that very few Ss hesitated in stating why something was alive, the expression of their opinion conveying a feeling of certainty. This is in contrast to Huang's (1943) assertion that children answer at random and can be easily swayed in their opinions.

Although the characteristics of an object might determine the particular words used by an S, results of the current study employing three tasks suggest that the general conceptual level telescopes S's thinking initially upon the presentation of a stimulus. One must recognize, however, that two stimulus items which differ only in the degree of abstraction inherent in them might well serve to focus the child differentially in his often transitory stage of conceptual development. This stage might be conceptualized as a bounded figure rather than a point in cognitive space; a child could conceivably maneuver along this continuum, with the upper end leading toward a higher conceptual level, being approached and overtaken in a series of ever-nearing sweeps, much like a pendulum attached to a slowly moving conveyor belt. Encounters
with situations along the way would cause the pendulum to swing, meeting with the most economical rectification of present stimuli with past experiences. Needless to say, this progression would not inevitably be in a forward direction, thus the backslides and failures which continue to occur even when the new concept appears to have been mastered. This description is similar to Piaget's concept of equilibration which holds that the organism is always striving towards a state of equilibrium. The process of changing from state to state is termed equilibration, with the additional processes of assimilation and accommodation serving to incorporate new situations or concepts (Phillips, 1969).

The single most impressive result gleaned from data in this study has been the consistency of 3-, 4-, and 5-year-olds in conveying their concepts of aliveness. To be sure, there were intra-subject disagreements, but a majority of Ss were markedly consistent. The three tasks were found to be reliable and valid instruments for the measurement of animism. Data from these procedures were analyzed with the optimal statistical techniques available, the results indicating that, by groups and individually, Ss could be categorized as possessing varying amounts of animism.

In summary, analyses of the responses to the three tasks in the present research generally support the description of the developmental sequence of animism
posed by Piaget and refined by Laurendeau and Pinard (1962). New directions suggested by Looft and Bartz (1969) were initiated in the present study and found to have close correspondence with traditional methods used. Therefore, the door is opened to pursue more rigorously the new avenues of research into the child's conception of aliveness.
APPENDIX A

CARD SORT STIMULI
APPENDIX B

STORY INQUIRY STIMULI
APPENDIX C

INSTRUCTIONS TO JUDGES FOR ASSIGNING

ANIMISM STAGES ON THE BASIS

OF QUESTIONNAIRE RESPONSES
INSTRUCTIONS

Please consider each Questionnaire protocol independently. Each one should be judged by the following criteria. Those items marked with an X have been scored as answered incorrectly, i.e., inanimate objects were labeled as being alive by the S. Consider all answers in determining the stage of animism. Please read the criteria carefully, and ask me any questions you might have before starting the judgments. Enter the stage next to the S's number on the tally sheet.

Stage 0: Incomprehension or refusal. This stage comprises those Ss who could not understand the questions or answered at random without ever giving valid explanations. An example of this type is the following:

Age 4:6: "You know what it is to be alive? What does it mean?---I don't know.---Is a mountain alive? ---No. ---Why do you say it is not alive?---Because it is sand.---The sun?---Yes.---Why?---It's warm when the sun is there.---An automobile? ---No.---Why?---Because it's not alive.---The table? ---Yes.---Why?---Because it's alive.---A cat?---Yes.---Why?---It says 'meow'.---A cloud?---No.---Why?---It's a sky, a cloud." (Laurendeau & Pinard, 1962, p. 141).

Often a subject in Stage 0 will use the same reason to attribute and deny life to objects, thus illustrating his ignorance of logical operations. This results in
contradictions in the protocol, typical of infantile, prelogical thinking. The child's "yes's" and "no's" often seem to be independent of his explanations. Another example of Stage 0 thinking:

Age 6:0: "you know what it is to be alive?---Yes. ---What does it mean?---To be born. Give me the name, tell me some thing which is alive.---Animals.---A mountain?---No.---Why?---I know it.---The sun?---No.---Why?---Because I know it.---The table?---No.---Why?---I know it.---An automobile?---No.---Why?---It runs.---A cat?---Yes.---Why?---We often see some cats.---A cloud?---Yes.---Why?---Because I say so.---A lamp?---No.---Why?---Because it's not alive. ---A watch?---No.---Why?---Because it runs.---A bird?---Yes.---Why?---Because it flies in the air. ---A bell?---No.---Why?---Because I know it.---The wind?---No.---Why?---Because it's something cold and does not run.---An airplane?---No.---Why?---Because it flies in the air like birds.---A fly?---Yes.---Why?---Because it flies in the air." (Ibid, p. 142).

Stage 1: Animistic thinking based upon usefulness, anthropomorphism, or movement.

Subjects in this stage commit errors of the animistic type by attributing life to one or many inanimate objects. These Ss use criteria which are imperfect, but the authors remark on the consistency of the child's thinking. "He never resorts to the same reason to attribute or refuse life" (Ibid, p. 145). Frequently a combination of two or even three of these criteria can be seen in explanations. Some children may refuse life to plants and trees by reason that they do not move, or are perceived by the child to be immobile. An example of this stage is:

Age 4:6: "You know what it is to be alive?---No. ---What does it mean?---I don't know.---Is a
Stage 2: Autonomous movement with some residual animistic thinking.

This stage, characterized as one of transition, is distinguished from Stage 1 by the discovery of two distinct sources of movement. Only one of these, that is, where the source of the movement is the object itself, now serves as a criterion for life. Laurendeau and Pinard discuss how this criterion alone does not serve to cause the total disappearance of animism. Most importantly, children continue for some time to delude themselves as to the real source of movement, particularly with regard to those objects most removed from direct experience, such as the wind, sun, moon, etc.

Another reason is that "the discovery of autonomous movement does not definitely displace the inadequate or imperfect criteria of the first stage. In fact, the most frequent occurrence is that the child relies upon autonomy to justify some of his responses, but for the other responses still resorts frequently to usefulness of objects, to their possessing anthropomorphic traits, or to their general movement. All subjects of this stage, however, at least make mention of autonomous movement."
(Ibid, p. 147). An example of Stage 2 thinking is:

Age 10:0: "What does it mean to be alive?---It means that you can move about, play, that you can do all kinds of things.---Give me the name of some thing which is alive.---You.---Is a mountain alive?---Yes.---Why?---Because it has grown by itself.---The sun?---Yes.---Why?---Because it gives light.---The table?---No.---Why?---Because the tree which was used to make the table is dead.---A cloud?---Yes.---Why?---Because it sends water on the earth.---The wind?---Yes.---Why?---Because it pushes things.---The fire?---No.---Why?---Because it cannot light up by itself." (Ibid, p. 148).

Stage 3: Total disappearance of animistic thinking.

Subjects in this stage never grant life to inanimate objects, at least to those listed in the Questionnaire. The reverse of this is not true, that is, Ss often refuse life to some animate objects, especially plants, on the basis of lack of autonomy and for anthropomorphic reasons. Explanations given may be anthropomorphic, or based on usefulness or activity. An example of this type of thinking is:

Age 9:0: "A mountain?---No.---Why?---It doesn't walk, it always remains at the same place.---The sun?---No.---Why?---It cannot move, it remains at the same place.---The table?---No.---Why?---It cannot displace itself.---An automobile?---No.---Why?---It needs a motor to make it run.---A cat?---Yes.---Why?---It can walk.---A cloud?---No.---Why?---It cannot displace itself.---A lamp?---No.---Why?---It cannot walk by itself.---A bird?---Yes.---Why?---It can fly.---A bell?---No.---Why?---It needs a man to ring it.---The fire?---No.---Why?---It does not displace itself as it wishes." (Ibid, p. 151).

General remarks about classifying protocols: A general rule of thumb is to determine the highest stage
on each protocol, even though that criterion might have been mentioned only once. Characteristic of all stages is that imperfect criteria from preceding stages may also be present. No errors are necessary for a Stage 3 rating.

Except for item 1, the items are recorded on the answer sheet by numbers. The list of corresponding stimulus items for these numbers are as follows:

1. mountain 13. car
2. table 14. cloud
3. cat 15. watch
4. lamp 16. bell
5. bird 17. airplane
6. wind 18. fire
7. fly 19. rain
8. flower 20. snake
9. tree 21. fish
10. bicycle 22. child (boy or girl, same sex as S)
11. pencil
12. sun 23. dog

Some common abbreviations I used during testing:

bec. or cau. = because
s.o. = someone
e.t. = everything, everytime
IDK = I don't know
w. = with
s.t. = something, sometime
a.t. = anything, anytime
s.b. = somebody
underlined consonant at end of word = add "ing" to word
arrow (→) = look on back of page for the rest of the response
l = like(s) or look(s)
REFERENCES


Comet, A. Positive philosophy, 1830-42, Book 6, Chapter 7.

Crannell, C. N. Responses of college students to a questionnaire on animistic thinking. Scientific Monthly, 1954, 78, 54-56.


Dennis, W. Historical notes on child animism. Psychological Review, 1938, 45, 257-266.


Huang, I. Children's conception of physical causality: A critical summary. J. genet. psychol., 1943, 63, 71-121.


Klingberg, G. The distinction between living and non-living among 7-10-year-old children, with some remarks concerning the animism controversy. J. genet. Psychol., 1957, 90, 227-238.


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