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THE DEVELOPMENT OF QUALITATIVE IDENTITY

by
Kelvin Lee Seifert

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Education and Psychology)
in The University of Michigan
1972

Doctoral Committee:

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To the young children who
made this study possible.

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Quite a few people have helped make this research possible. The members of my doctoral committee, listed on the title page, each provided helpful comments about the design of the research and of this report. Special thanks go to Drs. Scott Miller and Harold Stevenson for extra attention they gave to the manuscript. Thanks go also to the teachers and parents who provided the children for the study. There are too many of these people to list, but they came from the following schools: Little Farm Day Nursery, Little Lamb Day Nursery, Perry Nursery, Real Life Nursery, Riverside Park Nursery, and School Co-operative Nursery. Observer agreement was determined with the help of Ms. Gwen Purcell, a capable future preschool teacher. The films of the race and gender changes were made with the help of Mr. Douglas Rideout, of the Audio-Visual Center of the University of Michigan. His patience in working within the budget of a small dissertation grant is appreciated.

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CHAPTER 1

INTRODUCTION TO THE PROBLEM

The study reported here had three main purposes. First, it looked for evidence of "qualitative identity," a cognitive ability first discussed by Piaget (1968) and by Piaget and Voyat (1968) that consists of the ability to distinguish permanent from changeable attributes of an object. Second, it used the concept of qualitative identity to interpret the development of racial and gender identities. And third, it looked for correlations and decalages among several examples of qualitative identity. In this chapter an effort will be made to explain why these goals were selected. Doing so will first require discussing the nature of qualitative identity and the stages involved in its development. Then the limitations of previous research on identity will be discussed to show how that work led to the design of the present study.

The Nature of Qualitative Identity

Piaget has described a number of examples of qualitative identity. It is the belief, for example, that a person keeps the same self over time, in spite of changes in appearance due to growth; or the belief that a liquid stays the same liquid when poured to a new container, even if it changes its amount. It is the belief that a wire stays the same object even if it is bent, or that a child keeps the same gender even if he puts on clothes of the opposite sex. Some of these discriminations involve reversible changes in

appearance (liquid, wire), and others do not (growth of a body). But Piaget and Voyat regard them all as depending on the same cognitive structure, qualitative identity.

In one way, this structure resembles conservation, an ability that the Genevans have studied much more thoroughly (Piaget, 1957; Flavell, 1963, chapter 5). In both qualitative identity and in conservation, a certain property is believed to remain invariant in spite of certain transformations. In conservation, however, the constant property really consists of a relationship between more than one perceptual attribute -- a "compensation of relations," in Piaget's terms. The attributes, in addition, must be empirically reversible; changes in them are believed to compensate for each other.

The definition is clearly illustrated by the classic conservation of liquid task, in which water is poured from a tall, thin container to a short, wide one. Qualitative identity requires only that the child believe that the water is still the "same water" after it is poured. Conservation, however, also requires 1) that "quantity" involves both of the changeable attributes (height and width), 2) that the changes can each be reversed, and 3) that any change in one attribute is exactly compensated by a change in the other. Together these beliefs allow the child to form the groupings or concrete operations described in such detail by Piaget and his colleagues.

Thus defined, conservation presupposes the existence of qualitative identity. A child who conserves must also

believe that a liquid, when poured, remains the "same" liquid as well as the "same amount" of liquid. Piaget would probably point out, of course, that a conserver would be bored by questions of qualitative identity. At his stage of development, processes of equilibration probably would make him more interested in perceiving the relationships among attributes, and in grouping them into reversible operations. Qualitative identity requires neither of these skills, but only the ability to discriminate changeable from permanent qualities.

Stages in the Development of Qualitative Identity

Piaget and Voyat (1968) identified two main types of qualitative identities. The first involves objects undergoing empirically reversible actions -- bending a wire, for example, or pouring a liquid, or modeling a piece of clay. The second involves objects undergoing non-reversible changes -- for example, the growth of a plant, of a person, or of the child himself. Each type of qualitative identity is supposed to evolve through a separate series of stages.

For the reversible tasks, they describe four stages. In the first, a kind of pseudo identity is expressed because the child assimilates the perceptual changes in an object to the actions he can perform on it. When a liquid is poured from one container to another, the child still considers it the same liquid; or when a wire is bent, it is still the same wire. But at this stage, the object is the same only in the sense that the same set of actions can always be performed

on it, no matter what perceptual changes occur. No true qualitative identity has yet developed because the child is not yet isolating attributes of an object from his total sensori-motor experience of it. Only after he can isolate attributes, can he begin to identify which of these change and which remain constant.

In the second stage of development, the child's attention shifts to the particular perceptual attributes of an object, and his sensori-motor experience seems to be neglected. Now, when the liquid is poured, the child says it is not the same liquid; and when the wire is bent, it is not the same wire. They are not the same object because something perceptible has changed. The sensori-motor "sameness" of the previous stage becomes relatively unimportant to the child. On the other hand, the child does not yet notice that other qualities of the object simultaneously remain constant. When the liquid is poured, for example, it stays wet, transparent, and all in one piece (topologically continuous); the wire, though bent, is still narrow, stiff, and shiny. At this stage the child has made the first step toward true qualitative identity by learning to isolate in his mind certain attributes of the object. Identity is not fully achieved, though, until he can in addition discriminate changeable qualities from permanent ones.

The child has reached the third stage of the identity development when he finally can make these discriminations. Now he can decide whether an attribute stays the same or

changes from one occasion to the next. If it always is the same, the attribute is "permanent"; if not, it is "changeable." In this third stage of development, the child may say that a liquid, when poured, is the same liquid but that it just looks different, or that it has just changed shape. The child still, however, does not conserve the amount of the liquid. True conservation -- "quantitative identity," it might be called -- does not develop until after qualitative identity is well established.

The fourth stage of development is marked by the achievement of conservation, and in this sense does not actually concern identity. At this stage the water is believed not only to be the same, but also the same amount; the wire is not only the same, but also the same length. This stage is only possible for identities involving reversible changes. By definition, conservation requires objects for which reversible and compensating changes occur.

Identities without reversible changes, according to Piaget and Voyat, develop through a different series of stages. At first, again, the child asserts a pseudo identity: the growing plant or the growing child is believed to be always the same person or child, in spite of changes in appearance. The identity is not genuine, though, because the child does not yet take the changes in appearance into account; his behavior is supposed to be oblivious to them. Piaget and Voyat do not explain how a child in this stage assimilates the nonreversible changes with which he is

confronted. Presumably, as with reversible identities, he assimilates them to various sensori-motor schemas, though for non-reversible cases the authors do not make clear what is the nature of these schemas. A child cannot physically manipulate the growth of a body like he can manipulate the shape of a liquid or a wire. It should be noted that for nonreversible tasks, Piaget and Voyat did not actually present evidence for the existence of the first, sensori-motor stage. They only argued that it must exist; it seemed conceptually necessary to explain the next two stages, for which data are indeed presented. Their lack of data may be related to their confusion on this point.

In any case, the second stage in this series is marked by the first clear awareness of changes in appearance. At this stage the child asserts the adjacent points in the growth of a body are the same object, but not the extreme points in the growth (seedling versus mature plant, baby versus adult). Identity is not yet fully transitive. Achievement of full transitivity marks the third stage of development. Now the child again believes that the growing body is always the same, even though it changes appearance. His assertions of identity in this stage reflect a genuine rather than a false identity. Unlike the first stage, he now notices visual differences, and unlike the second stage, he is not dominated by or "centered" on them.

Identity for reversible tasks is supposed to be achieved earlier than identity for nonreversible tasks. For the former, pseudo identity (Stage I) is supposed to occur at about

ages three to four; denial of identity (Stage II) is supposed to occur around ages four to five; true identity, (Stage III) is supposed to occur around ages five to six; and conservation (Stage IV) is supposed to occur from about age six onward. For nonreversible tasks, Stage I also is supposed to occur around age three; but Stage II, partial transitivity, may last until about ages five or six; and Stage III, complete identity, is not supposed to appear until about age six or seven.

For both types of qualitative identities, the second stage contradicts common sense expectations. For those with reversible changes, the child is predicted to deny identity after previously asserting it; for those with nonreversible changes, he is predicted to deny identity if the object changes more than just a little. In the first case common sense might not expect the child to contradict his earlier belief, and in the second case it might not expect identity to depend mainly on the extremity of the change.

In spite of stating that in "some cases" a child may move directly from the first to the third stage, with no intervening period of denial (p. 13), Piaget and Voyat devote considerable discussion to Stage II and give many examples of it. In doing so they imply that this stage must occur to most children on most possible identity tasks. Just how much it occurs, though, remains to be studied.

Identity Research and its Limitations

The original evidence for these stages was drawn from

seven tasks -- three involving reversible changes, and four involving nonreversible changes. The tasks with reversible changes were the traditional conservation experiments: pouring liquid from one container to another, bending a wire, and modeling clay to a new shape. The tasks involving nonreversible changes all concerned the identity of various bodies during growth. One, for example, concerned beliefs about the child's own self identity over time: does a child believe he stays the same person in spite of gradual changes in his physical appearance? For this task children were asked to draw pictures of themselves at different points in their lives, from infancy to adulthood; then they were asked whether different pairs of pictures represented the same person. Similar procedures were used to study the identity of the experimenter over time, the identity of an artificial plant grown with chemicals, and the identity of a burning candle. Using interview protocols, Piaget and Voyat presented examples of each of the identity stages for many of the tasks.

The research on these tasks had several limitations. It lacked important methodological controls; the definitions of the identity stages remained unclear; it was mostly confined to the identities of physical objects; and it ignored possible decalages and correlations among the different identity tasks. These limitations, which are discussed below, helped to define the research problems of the present study of qualitative identity.

Consider first the methods used by Piaget and Voyat. Following their philosophical orientations, they presented mainly anecdotes and interview protocols as supporting evidence. The only measure concerned the frequency with which children seemed to respond at the various stages on one of the tasks (liquid identity). Even here, though, they did not define the criteria by which they categorized their protocols into the different stages. For the other tasks, they failed to give any statistics at all. Upon how many children did they base their interpretations? Were the children taken from the same group on every task? How many boys and girls were included? How reliably could the interviews be classified into stages? Presumably Piaget's continuing epitemological and philosophical interests caused these questions to be neglected.

In the interviews presented as examples, for instance, Piaget and Voyat did not seem to notice that their questioning procedure differed systematically according to the age of the child. Generally they asked the older children to provide reasons for their identity beliefs, but not the younger children. Questions for children less than about six years old mainly required just "yes" or "no" responses, and one-word responses were indeed all that these children gave. The investigators attempted to elicit reasons only from children more than about six years old. It is not clear from the monograph whether they followed this procedure by deliberate, theoretically-based choice, or simply

because they were not successful in getting responses to "why" questions from the younger children; but the monograph gives the impression that Piaget and Voyat did not realize the difference in their procedures for children of different ages.

The research by Piaget and Voyat therefore did not in itself show that the children in Stage I really based their assertions of identity on assimilation to sensori-motor schemas, nor that all the children in Stage II based their denials of identity on perceptual changes. No doubt the Genevans derived their explanations of the stages from other evidence about the timing of sensori-motor development; but their monograph does not in itself show a relationship between the sensori-motor period and identity development.

The children's reasons for asserting or denying identity, though, are crucial evidence for the stage theory of identity development presented in this study and by Piaget and Voyat. If the Genevan theory is testable, then children in Stage I (pseudo identity) should somehow express their sensori-motor assimilations of changes; children in Stage II, their visual perception of changes; and children in Stage III, their visual perception of both changes and constancies. If this theory is to be tested, ways must be found to observe these differences.

The ways used in the Piaget and Voyat monograph are unclear. Not only did the questioning differ systematically by the age of the child, but also it varied among individual

children. Some children seemed to be asked only two or three questions, and others seemed to be asked ten or twelve. Some seemed to be asked with one phrasing, and some seemed to be asked with another. Some of these apparent variations in procedure may have resulted from the investigators' presenting different excerpts of the interviews for each child. But the variations are too great to be explained entirely in this way. A major problem for further research on qualitative identity, then, consists of specifying definitions for the stages of development posited by Piaget and Voyat.

Even after definitions are found, the research on qualitative identity will need to be extended to more areas of preoperational cognitive development. Qualitative identity would appear to influence the cognitive behavior of young children in a considerable variety of situations. It is involved, for example, in the acquisition of gender identity: a child must learn that his gender stays the same even though his physical appearance may continually change. Likewise, it is involved in the acquisition of racial identity: a child learns that his race is fixed even though his clothing or his racial preferences may change. The monograph by Piaget and Voyat did not cover important areas of socialization like these. This work has been left for others (Kohlberg, 1966; DeVries, 1968; DeVries, 1969).

Kohlberg presented a cognitive-developmental theory for the acquisition of gender identity. He cited considerable

research suggesting that children's concepts of gender develop by forming a particular kind of qualitative identity. In this case, children learn to separate the one essential and unchanging quality of gender -- genitals -- from other variable, but gender-related qualities, like hair style or clothing style. In one study, for example, he showed children a schematic drawing of a boy or a girl, and asked whether certain changes in its appearance would be enough to change its gender. Would the child change its sex if it got hair like the opposite sex? If it put on clothing like the opposite sex? If it did both? The drawing was equipped with overlays used during questioning to show the changed features. The results showed a steadily increasing degree of gender identity with age, with a corresponding decrease of attention to immediate, visually apparent changes in gender. The children's responses could be classified reliably into a Guttman scale with high reproducibility and consistency, and their scores increased steadily with age. The scalogram analysis suggested that gender identity formed a unitary scale of development, and that some of the steps along that scale would be identified.

This study differed from previous work on gender development in its focus on children's gender concepts, rather than gender preferences (Spencer, 1967). It was a study of gender "identity," meaning a belief in gender constancy, rather than of "identification," meaning gender preference. Kohlberg presented evidence from other studies to suggest

that gender identity did not result from psychoanalytic or social leaning mechanisms. Contrary to social learning predictions, he pointed out, gender identity usually cannot be modified by reinforcement and extinction procedures. And contrary to psychoanalytic predictions, it seems to develop at about the same rate as concepts with no sexual content. Instead, Kohlberg found that a child's degree of gender identity correlated with his development on other qualitative identities. These other tasks were not specified in his report, though presumably they include at least some of the same tasks studied by Piaget and Voyat. In any case his findings suggested that gender identity developed as part of a broad cognitive structure, qualitative identity.

The development of several socially defined identities has also been studied by DeVries (1968, 1969). One of these was the development of generic identity, the belief that an animal must remain the same species despite apparent changes in its physical appearance. In one experimental condition preschool boys were shown a friendly cat that appeared to become a dog after the experimenter fitted it with a realistic mask of a dog's head. Children were asked a number of questions about what they saw, such as whether they thought the dog were real, and whether magic might have caused the cat to change its species. Similar procedures were used to study "changes" in species from dog to cat and from cat to rabbit. As with Kohlberg's gender identity study, DeVries found that interview protocols could be reliably ordered along a Guttman

scale with considerable reproducibility and consistency, and that children's scores correlated with age. Steps on the scale ranged from simply "recognizes that some change occurred" up to "asserts constancy without contradiction." Most subjects fell in between these extremes in the age range studied, three years through six years. In general, most preschool boys asserted qualitative identity on this task to some extent, but they did so consistently only by about age six or seven.

In the same way it would seem possible to study children's race identity, in the sense of race constancy. The Piagetian view of race identity development would predict that young children express various degrees of race constancy, depending partly on how much they were able to separate the essential racial quality -- skin color -- from nonessential ones, like hairdo. Partly, too, a child's level of development would depend on his general ability to identify qualities, as expressed by his performance on other identity tasks. Complete racial identity would not be expected until qualitative identity were established in most areas of the child's thought.

No studies of race awareness, however, have tested these predictions directly. Many have used the term race "identity," but really meant race "preference." Among the ones that have actually concerned race concepts, none has examined degrees of race awareness of identity within individual children. Generally they have only counted the frequencies with which children of different social groups

or ages correctly identified the race of dolls, of pictures, or of real people (Stevenson, 1967). There is no evidence in most of these studies that individual children increased their degree of race identity with age; only that with age more and more children expressed conventional racial stereotypes. Information about their degree of identity could come only from a more elaborate questioning procedure such as used by Kohlberg or DeVries. Testing race identity's relationship to qualitative identity in general would require, in addition, correlations with other identity tasks such as made by Kohlberg.

Considering a wider range of identity tasks leads to a third limitation of the original identity research: its failure to consider fully the possible correlations and decalages among different qualitative identities. As Pinard and Laurendeau (1970) point out, information about decalages is needed for an empirical testing of Piaget's theories: if differences in timing prove too numerous or too large, they reduce the clarity and usefulness of the stage concept so central to Genevan theory. Piaget and Voyat considered decalages only for identities involving nonreversible changes. They found the following sequence for three such identities: the child's own body, the body of another person, and the body of an artificial, chemically grown plant. But decalages were not studied among identities involving reversible changes, nor between identities involving reversible and ones involving nonreversible changes.

Correlations among various tasks would suggest that qualitative identity does indeed form a relatively unified cognitive ability that develops through cumulative steps. Yet Piaget and Voyat presented no evidence for correlations. They seem only to assume that the same children who move through the identity stages on one task, will also move through them on another, and that developments on different tasks will correlate. Kohlberg claims to have found such evidence, but he has not presented the details of it. DeVries has found correlations among several qualitative identity tasks, but they have all been nonreversible identities and related to socialization. Such identity tasks have yet to be correlated with the original identity tasks studied by Piaget and Voyat.

Basic Procedures of the Study

The present study remedied the limitations of the Genevan research on identity. A number of controls were imposed on the experimental design, including specific definitions for qualitative identity; the research was extended to two areas of socialization, gender and race; and preliminary information was provided about decalages and correlations among several identity tasks. Three tasks were selected to meet the first goal: to demonstrate the existence of qualitative identity as defined by Piaget and Voyat, but under more controlled conditions. Two of these involved reversible changes in the object, and one involved nonreversible changes. The two "reversible" tasks replicated as

closely as possible two tasks done by Piaget and Voyat: pouring a liquid and bending a wire. The child was asked after each task whether he thought the liquid (or wire) was the same object, and why. He was also asked a conservation question: was the liquid (or wire) just as much to drink (or just as long) as before? The interviews mainly concerned Stage II, though, in which the child is supposed to deny the identity of the object after it changes.

For technical reasons none of the original nonreversible tasks could be replicated precisely. The drawings that Piaget and Voyat asked children to make proved too difficult for the three- and four-year-olds in this study. The artificial chemical plant proved difficult to create reliably. Their procedures were therefore modified by providing the child with a series of realistic drawings of a plant at different stages in its growth, from seedling to maturity. The child was asked whether various paris of the series represented the "same" plant. This procedure bypassed whatever limitations the child might have in drawing ability. A plant was used instead of a human being because the steps in its growth could be illustrated more clearly.

The remaining four tasks were used to extend the theory of qualitative identity to two new areas of socialization, race and gender. Two of these tasks called upon children to comment on drawings of a child who appeared to change his race or his gender. In the gender task, children were shown drawings of a child who "changed" its clothing and its

hairdo to those of the opposite sex. They were asked whether these and other changes could actually change the child's gender. In the race task, children were shown several drawings of a boy who "changed" his skin color and his hairdo. Children were asked whether these and other changes would cause the boy to change his race. The last two of the identity tasks used films to study race and gender identities. As in the previous pair of tasks, children were asked to comment on a child who appeared to change his race or his gender; but in these, the child who changed was transformed on film rather than in drawings.

In so far as possible, the results of all the tasks were compared with each other to suggest tentative decalages and correlations among them. Decalages would be shown by differences in the average set at which full qualitative identity was achieved for each task. The combination of small decalages and high correlations among tasks would suggest the existence of a unitary developmental ability, qualitative identity.

Hypotheses About Identity Development

The goals of the study can be summarized in five hypotheses. These are given below, with the tasks used for testing each of them.

HYPOTHESIS 1: For tasks involving empirically reversible changes, Stage II of identity development can be observed: some pre-school children deny identity of the object, and this behavior is age-related.

HYPOTHESIS 2: For tasks involving nonreversible changes, Stage II of identity development can also be observed: some pre-school children deny transitivity of identity of the object, and this behavior is age-related.

The first hypothesis was tested by the two reversible tasks -- pouring a liquid and bending a wire. The second hypothesis was tested by the nonreversible tasks -- the series of plant pictures. Both hypotheses focused on Stage II of development because, as discussed above, this stage contradicted common sense expectations.

HYPOTHESIS 3: An age-related increase of qualitative identity can be observed for race and gender.

The remaining tasks -- the race and gender drawings and films -- tested this hypothesis. The filmed version provided more thorough information than the drawings, but the drawing versions had the advantage of direct comparability with the first three tasks.

HYPOTHESIS 4: Differences in the timing of development can be observed among the various qualitative identity tasks.

This prediction is suggested by the extensive evidence for decalages in conservation studies. Existing theory to interpret decalages, however, is still too rudimentary to allow for specific predictions about identity decalages, and developing such theory is beyond the scope of this study.

HYPOTHESIS 5: Correlations in the timing of development can be observed across different identity tasks.

Correlations would support the assertion that qualitative identity is a unitary cognitive ability, rather than a group of specific but unrelated abilities. Presumably the correlations

would be higher between similar tasks (liquid, wire) than between dissimilar ones (liquid, race).

CHAPTER 2

METHODS OF STUDY AND SCORING PROCEDURES

The research reported here was conducted as two studies. The first concerned five different tasks: liquid, wire, plant, race drawings, and gender drawings. The second concerned two: race change and gender change films. The methods will be described separately for each study. Then the scoring procedures will be described.

Study 1

Subjects for Study 1 were forty-nine middle-class boys, ages forty to seventy-five months. The average age of the sample was 55.7 months. Nine were between three and four years old; 23, between four and five; 14, between five and six; 3, more than six years old. All except two were white, and the exceptions were both half oriental. The subjects were taken from two different day nurseries in Ann Arbor, Michigan. Twenty came from a cooperative nursery school in which each class met two or three times per week for about two hours each time. The remaining twenty-nine boys came from an educationally oriented daycare center, at which each class met five times per week for eight hours or more. Two children from the day-care center were excluded as subjects because of known hearing and speech problems that would have interfered with their performance; the rest, in the opinions of their teachers, were all physically, emotionally, and intellectually normal.

Before testing, the experimenter spent about one hour in each classroom from which subjects were taken. This time allowed the children, especially the younger ones, to overcome their initial shyness with the experimenter. One testing session was held with each child, and it lasted about fifteen minutes. In the session the child was given the five qualitative identity tasks described below. The order of the tasks was varied randomly across subjects and age groups. All interviews were tape recorded and scored from the recordings. The procedures and questions for the tasks are described below, and the scoring procedures are discussed in the next chapter, with the results.

1. Liquid and Wire Tasks. These two tasks differed in the materials used, but not in the questions asked of the children. The liquid task used a standard 100 ml test tube for the tall, thin container, and a low, wide-mouthed jar for the low, wide container. At the state of the experiment, the test tube was already filled nearly to its top. After examining the water, the child poured the liquid from the tall to the wide container. Then the experimenter asked the interview questions described below.

The wire task used an ordinary white pipe cleaner, about four inches long. The child was given the wire to examine, and then he was encouraged to bend it more than ninety degrees. After bending it, he was asked the following questions.

For each of these tasks, these five questions were asked with the appropriate selection of words:

1) Is this still the same (liquid/wire) as before?
2) Why?/Why not?
3) Is it a new (liquid/wire) now?
4) Why?/Why not?
5) Is it just as (long/much to drink) as before?

Four sets of questions from this interview were chosen to define the "denial" stage of identity development: the first pair (#1,2), the second pair (#3,4), and first, third, and fifth questions, and the first question alone. Each of these sets isolated the Stage II responses (the denials of identity), the stage of primary concern for the original hypothesis about reversible tasks.

2. Plant Identity Task. The child was shown five drawings of a tulip plant. Each represented the plant at a different stage of its growth, from a small sprout to a fully mature plant. The experimenter told the child, "Here are some pictures of a plant that I grew." Then, showing the child the first in the series, the experimenter said, "Here is the way it looked when I first planted it." For each of the next pictures, the experimenter said, "Here is how it looked a little while later." After the child examined the whole series, the experimenter mixed the pictures up in a pile, and asked him to "spread the pictures out the way they should go." If the child did not understand, the experimenter then said, "Put the pictures in their right order."

In Piaget and Voyat's original tasks the child had seriated the pictures, if he was able, during his act of drawing them. The present procedures tried to provide an laternative way for the child to seriate the stage of growth

even though he did not draw the pictures himself. His actual ability to put the five pictures in order was not recorded. The procedures were used only to help insure that if a child already had partial or full transitivity of identity, then he would apply it to this particular task.

After these preliminaries, the experimenter showed the child three pairs of pictures: the first two of the series, the first and last, and the first and third. For each pair he asked, "Are these pictures of the same plant?" The procedures measured the transitivity of identity beliefs, in this case beliefs about a plant at different stages of its growth. In doing so the procedures made it possible to discover any relationship between the growth of transitivity and age, and between the growth of transitivity and of other examples of qualitative identity.

3. Gender Identity Task. A simple, schematic drawing of a boy or a girl was shown to the child. The drawing was equipped with overlays that made the child in the picture appear to change its hairdo or its clothing to that of the opposite sex. Each subject was asked a number of questions about the child represented in the drawing. The overlays were changed at appropriate points to help illustrate the questions being asked, which are given below. The example describes the change from girl to boy, but parallel procedures were used for the change in the other direction.

1. (Show the girl picture.) This is a girl, isn't it? Her name is Janie. If Janie really wanted to be a boy, could she be?

2. (Continue showing the girl picture.) If Janie played with trucks and did boy things, then what would she be?

3. (Show the girl picture, but with the boy's hairdo added.) If Janie grew boy's hair like this, then what would she be?

4. (Show the girl picture, but with boy's clothing.) If Janie put on boy's clothes like this, then what would she be?

5. (Show girl picture, but then add both boy's clothing and boy's hairdo.) If Janie cut her hair short like this and she put on boy's clothes like this, then what would she be?

For each question, the experimenter followed up with another question if the child did not seem to know what was expected: would it be a boy or a girl?

The questions and procedures were taken from Kohlberg (1966) and DeVries (1968). For this study, though, each child was shown a gender change only in one direction, rather than in both. The direction was balanced across subjects and age groups: half saw a boy "change" to a girl, and the other half saw a girl "change" to a boy. Their version of the gender identity task was given in order to relate the physical identities studied by Piaget and Voyat to the social identities studied by Kohlberg and DeVries and by the present research.

4. Race Identity Task. This task used four realistic drawings of the head of a young boy. One of these showed the boy with Caucasion, straight brown hair and light ("white") skin; another, with Negroid, "Afro" style hair and dark brown skin. The remaining two pictures each showed a boy of "mixed" race. One had Caucasion hair and Negroid skin, and

the other had Negroid skin and Caucasion hair. The features on all four pictures were ambiguous as to race.

Each subject was shown the completely white and the completely black drawings, and asked to identify the "white" boy and the "black boy." After the child did so, the experimenter selected one of these two pictures to begin further questioning. Half the children saw a white boy change to black, and the other half saw a black boy change to white: the direction of the change was balanced across age groups. At appropriate points the experimenter showed the other pictures in the series. The questions are given below with the shite-to-black direction used as an example:

1. (Show the picture of the white boy.) If Mike really wanted to be black, could he be black?

2. (Show the picture of the white with "Afro" hair.) If Mike's hair turned dark and curly like this, what would he be?

3. (Show the dark child with Caucasion hair.) If Mike's skin turned dark like this, what would he be?

4. (Show the completely Negroid child.) If Mike's hair grew curly and dark like this and his skin turned dark like this, then what would he be?

If a child seemed confused by any of the questions, the experimenter followed it up with another: would Mike be white or black? After responding to the first four questions, the child was asked three more, this time concerning real, live boys:

5. Could a real white boy ever become black?

6. Could a real white boy ever become black when he grew up?

7. Could magic change a real white boy to become black?

The first four questions paralleled the questions on the gender task; the last three extended the task to include real, as well as pictured, boys. Altogether, the questions extended the study of qualitative identity to a new area of socialization, race identity.

Study 2

Subjects for this study were fifty-one middle-class, white boys, ages thirty-four through eighty-eight months. The average age of this sample was 62.3 months. Twelve were less than four years old age; 12, between four and five; 17, between five and six; and 10, more than six years old. They were taken from four private day-care centers in Southeastern Michigan, but not the same ones used for Study 1. All the children were considered normal by their teachers. Testing procedures were identical to those in Study 1: the experimenter spent about one hour in each classroom to get acquainted with the children, and then took children individually to another room for testing. The testing session itself took about ten minutes for this study.

After a particular child was selected, he was asked if he would like to come with the experimenter "to see some movies." Most of the children accepted this invitation with enthusiasm, and all were at least willing to come. After the child and the experimenter settled down alone in a special room away from the class, the experimenter started by showing two pairs of drawings: one of a boy and a girl, and the other of a white boy and a black boy. As a warm-up task, the

child was asked to identify the sexes correctly in the first pair, and the races correctly in the second. All children proved able to identify these pictures correctly. In this respect the sample seemed to have greater knowledge of race and gender stereotypes than preschool children in previous studies of stereotypes (Spencer, 1967; Stevenson, 1967), though the differences was not large.

The race and gender change films were then shown to the child. The following three questions were asked during the film, but before the child saw the race or gender change:

1. If this boy really wanted to, could he ever change to be girl (or a black)?
2. When this boy grows up, then could he be a girl (or a black)?
3. What about magic? Could magic change this boy to be a girl (or a black)?

After the child saw the identity change, the following four questions were asked:

4. Is this the same person as before?
5. If this girl really wanted to, could she ever change to be a boy?
6. When this girl grows up, then could she be a girl?
7. What about magic? Could magic change this girl to be a boy again?

Finally, after the film ended, the child was asked the following questions:

8. If you really wanted to, could you ever be a girl (or a black)?
9. When you grow up, then could you be a girl (or a black)?

10. What about magic? Could magic ever change you' to be a girl (or a black)?

In Study 2, all children saw the gender change from boy to girl, and the race change from white to black. Changes were not made in both directions because the expense of the added filming would have been prohibitive.

With the exception of question No. 4, then, the same questions were asked both before and after the child saw the transformation. This procedure provided a measure of the stability of the identity beliefs: if they were stable, they should not be affected by the "impossible" changes seen in the movie. Stable beliefs would suggest, in addition, that race and gender identity were heavily influenced by a general, internal cognitive structure, qualitative identity. If, however, gender and race "identity" were only extensions of social stereotypes, they should be undermined more easily by apparent empirical disconfirmation. The design of Study 2 allowed these predictions to be tested.

Questions No. 8, 9, and 10 were included in order to assess another example of these identities, namely the gender and race identities of the child's own self. Using the same questions asked during the film allowed a direct comparison with the identity beliefs about the child pictured in the films. Possibly the identity of a pictured child followed the predicted path of identity development, but the identity of the child's own self did not. The procedures allowed this possibility to be tested.

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Definitions of Stage II Responses

The ways of defining Stage II responses varied with each task, and are described below. Reversible and non-reversible tasks required different definitions. The plant and the gender drawing tasks could each only sensibly be defined in one way because of the nature of these interviews. The race drawing task and the two film tasks, however, allowed for several possible definitions of Stage II.

1. Liquid and Wire Tasks. For these tasks, the four groups of questions were used which were described above and are listed on page 21. Each group formed a separate criterion by which to define Stage II responses. Examples of such responses are given in the table for each of the criteria.

2. Plant Task. For the plant task, each child was given a total score equal to the number of questions on which he asserted qualitative identity. The total, which will be called the "identity score," provided a measure of

the child's progress toward full qualitative identity. A low identity score indicated little transitivity of identity (i.e., Stage II), and a high score indicated high transitivity (i.e., Stage III, or near it). Similar identity scores were defined for all the nonreversible tasks described below, though the particular items varied for each task.

3. Gender Drawing Task. For this task, each child was given a total identity score equal how many of the following items he passed:

1) Minimally resists the suggestion of gender change (e.g., through gestures or hesitation).

2) At some point actually says that gender cannot change.

3) Says that gender cannot change even if the child in the drawing wants it to.

4) Says that gender cannot change even if the child played with toys of the opposite sex.

5) Says that gender cannot change even if the child changed its hair or clothes to those of the opposite sex.

6) Says that gender cannot change even if the child changed its hair and its clothes to those of the opposite sex.

7) Verbalizes constancy principle: e.g., "gender can never change."

Items No. 2-6 correspond to specific questions asked during the interview. The observer agreement described in the next section, however, was calculated for the seven items above.

4. Race Drawing Task. Three identity scores were found for this task. The first was similar to the gender identity score. Each child was given a total score equal how many of the following items he passed:

1) Minimally resists the suggestion that race can change.

2) At some point says that race cannot change.

3) Says race cannot change even if the boy in the drawings wanted it to.

4) Says race cannot change even if the boy changed his hairdo.

5) Says race cannot change even if the boy changed his skin color.

6) Says race cannot change even if the boy changed hairdo and skin color.

7) Says he himself cannot change even if he wanted to.

8) Says he himself cannot change race even when he grows up.

9) Says he himself cannot change even by magic.

Items No. 3-9 corresponded to specific questions on the race drawing interview, but as for the gender drawing task, observer agreement was calculated for all the items on scale above.

In addition to a total identity score, each child was given an identity score corresponding to each of two subsets of the nine items. The first subset consisted of the six items concerning the boy in the drawings -- items No. 1-6. The second consisted of the five items concerning the live boy being interviewed -- items No. 1, 2, 7, 8, and 9. Note that the first two items of these subscales overlapped, since they could concern either the "drawing" boy or the "live" boy.

5. Gender and Race Film Tasks. For each of these tasks, the child was given three identity scores, one for each main part of the interview. The first, which was called the "before" identity score, equalled how many of the following items the child passed before seeing any change occur in the film:

1) Says the child in the film cannot change even if he wanted to.

2) Says the child could not change even when he grows up.

3) Says the child could not change even by magic.

The second, which was called the "after" identity score, equalled how many of the following items the child passed after seeing the change on the film:

1) Says the child is still the same person.

2) Says the child could not change again even if he wanted to.

3) Says the child could not change again even when he grows up.

4) Says the child could not change even by magic.

The third, which was called the "live" identity score, equalled how many of the following items the child passed about his own identity:

1) Says he himself could never change, even if he wanted to.

2) Says he himself could never change even when he grows up.

3) Says he himself could never change even by magic.

Preliminary Scoring

The interviews for the tasks contained two main kinds of questions: those concerning identity beliefs, and those concerning reasons for these beliefs. The latter -- the "why" questions -- were asked only in the liquid and wire task interviews. For each type of question, responses could be classified into four categories. Responses to the first

type, the identity belief questions, could be placed into the following four categories: 1) assertions of identity, 2) denials of identity, 3) contradictory identity beliefs, and 4) ambiguous responses. A response was placed in the "contradictory" group if the child first asserted identity clearly, and then denied it, or if he first denied it and then asserted it. A response was placed in the ambiguous group, however, if it could not be understood from the tape recording because the child mumbled, remained silent, or made an irrelevant statement.

The second type -- the "why" questions -- could be placed into the following four categories: 1) refers to sensori-motor actions on the object, 2) refers to perceptual changes of the object or to perceptual changes as well as sensori-motor changes, 3) contradictory reasons, and 4) ambiguous reasons. A response was placed in the "contradictory" category if the child asserted a sensori-motor reason, and then denied it, or if he asserted a perceptual reason and then denied it. Responses asserting both types of reasons, though, were placed in the "perceptual" category. This placement was made on the Piagetian assumption that a "perceptual" reason showed a higher level of cognitive development, and that any expression of a higher level supplemented, but did not contradict, a lower level of development. For the "why" questions, responses were classified as "ambiguous" if the child's response could not be inferred from the tape recording because he mumbled, remained silent, or made an irrelevant statement.

For both kinds of questions, only the first two types of responses were used in the data analysis. The ambiguous and contradictory responses could not be used because by definition they neither confirmed nor denied the developmental trends predicted in this study. During the actual scoring, therefore, ambiguous and contradictory responses were both placed in a single, joint category, which might be called "unscorable" responses.

Stability and Observer Agreement

Ten children from Study 1 were selected to assess the observer agreement and stability of these response categories. The group was selected randomly, but balanced across the age range to insure a wide variety of responses. Stability was defined as the proportion of agreement of one observer with himself over a period of time. Observer agreement was defined as the proportion of agreement of two observers scoring independently. In this study stability was measured using the principal investigator scoring twice over a period of two weeks. Observer agreement used the principal investigator and an undergraduate assistant specially trained in the meanings of the questions and in the scoring procedures. Her training took a total of about ten hours.

Both statistics were found to be quite high. Average stability was .95, and average observer agreement was .93. Only one item had a stability coefficient below .80 (item No. 6 on the race task had .70), and only one had an

observer agreement coefficient below .80 (item No. 10 on the plant task had .70).

CHAPTER 3

RESULTS AND DISCUSSION

The results are organized around the following main headings. First the significance of the unscorable responses will be discussed. The rest of the findings will be organized around the major purposes with which the study began. The evidence will be presented and discussed for qualitative identity as it was originally defined by Piaget and Voyat. Then the evidence will be given for race and gender identity, including both the drawing and the film versions. Finally the evidence for correlations and decalages among the tasks will be presented.

Unscorable Responses

Identity Question. These were the questions on which children were asked to deny that the object stayed the same in spite of a reversible change in appearance. For most of these questions, unscorable responses formed only a small proportion of all the responses. Though the proportion ranged as high as .31, the mean proportion was only .06. Giving an unscorable response to an identity question showed no relationship with age (point-biserial correlation). The proportion of unscorable responses, however, was inversely correlated ($r = .56$, $p < .01$) with the proportion of children asserting identity: unscorable responses were most frequent on questions where the fewest children asserted identity.

This relationship is plausibly explained by assuming that questions yielding the fewest assertions of identity measured the highest levels of identity development. On this assumption, the children at moderate and low levels of development might be expected to respond to the "rough" questions by contradicting themselves or by failing to respond at all, rather than simply by asserting or denying identity. Questions measuring the highest levels of development would cause the largest numbers of children to respond with contradictions or silence.

Furthermore, the kind of unscorable response that is given might depend on the child's level of identity development. Genevan theory suggests that contradictions would tend to be given by children who are just short of the full identity ability. Their contradictions can be interpreted as a vacillation or oscillation between earlier and later forms of equilibrium, which Piaget believes to immediately proceed full acquisition of the later form. Ambiguous (i.e., mainly silent) responses, on the other hand, may be given by children still far from acquiring qualitative identity. Presumably they would fail to respond because they are simply oblivious to the nature of qualitative identity; they do not understand an identity question when it is asked. In further research on identity, analyzing ambiguous and contradictory responses separately might test these possibilities

"Why" Questions. Similar considerations apply to the unscorable responses to the four "why" questions on the liquid and wire tasks. These questions, it will be recalled, asked children to give reasons verbally for their identity beliefs. The proportions of unscorable responses for these questions were extremely high: they ranged from .49 to .75, with a mean of .60. Again, there was no relationship between giving an unscorable response and age. As with the identity questions, however, combining ambiguous and contradictory responses may have hidden separate and opposing correlations with age.

The nature of the "why" questions suggests, in addition, that a majority of the unscorable responses to these questions were ambiguous, rather than contradictory. The questions required children to state their reasons for their identity beliefs verbally, but doing so may have required more language ability than most preschool-age children possess. This possibility seems especially likely for children still supposedly close to the sensori-motor level on the tasks; by definition, they cannot represent their reasons in language very well. Children who are preoperational, however, may also have difficulty expressing verbally their reasons for identity beliefs, even if they can express the beliefs themselves. This inability to respond is reflected in the relatively small numbers of older children in the sample who were able to give reasons. Among all children giving unscorable responses, then, failing to give reasons seems more

likely to occur than giving contradictory reasons. This possibility cannot be tested, though, without classifying ambiguous and contradictory reasons separately.

The scarcity of responses to the "why" questions limits the testability of the theory of qualitative identity presented by Piaget and Voyat. As discussed in Chapter 1, a child's reason for asserting identity determines whether he has developed true qualitative identity or only a "pseudo" sensori-motor identity. In addition, his reason can corroborate the validity of a denial of identity; according to the theory, no child can deny identity for sensori-motor reasons. To test the theory fully, therefore, methods must be found to determine a child's general level of cognitive development on each specific identity task. The method used by the present study -- simply asking the child -- failed to provide sufficient data. It is not clear, from this or any previous identity research, what alternative might work better.

But the problem of asking children "why" does not completely present Piaget's theory of identity from being tested. The theory still predicts a relationship between age and identity beliefs. Assertions of identity are supposed to occur only early and late in the formation of qualitative identity; and denials, only in the middle of development. A prediction therefore can be made about the statistical relationship of identity beliefs to age. The mean age of assertions and denials should be about the same,

and the variance of the age of denials. Denials, in other words, should occur "in between" assertions. This prediction was tested by the present study, and the results are given in the next sections.

Basic Evidence of Qualitative Identity

The basic evidence for qualitative identity was provided by the liquid, wire, and plant tasks. The results from them gave partial support for the existence of Stage II as defined by Piaget and Voyat. Some children on the two reversible tasks denied identity, and some on the nonreversible task expressed only partial transitivity, of identity by asserting the identity only of small changes. But these responses showed no relationship with age. The results are discussed in more detail below.

Results for the Liquid and Wire Tasks. Many children denied identity on the liquid and wire tasks. On the liquid task, .22 of the children denied identity by one or another scoring criterion, and on the wire task, .52 of the children denied it by one or another criterion. Table 1 shows the proportions of denials for particular scoring criteria and tasks. These ranged from .06 to .21 on the liquid task, and from .06 to .49 on the wire task.

These figures, it should be emphasized, are the proportions of the entire sample that actively and unambiguously denied that identity remained constant after the object changed its appearance. For the first two scoring criteria,

TABLE 1

PROPORTIONS OF DENIALS OF IDENTITY BY TASK AND SCORING CRITERION (N=49)

Scoring Criterion	Task: Liquid	Wire
1	.08	.18
2	.06	.06
3	.10	.08
4	.21	.49

the proportions of denials include the children who not only denied identity, but also justified their belief by verbally noting the change that occurred to the object. For the third criterion, the proportions include the children who denied identity on two differently phrased identity questions, and who also denied conservation. For the fourth criterion, the proportions include the children who denied identity on the first question in the interview, regardless of their other identity behaviors. The proportions of denial were somewhat larger for this last criterion, possibly because it consisted of only one question.

Denial of identity, however, showed no relationship with age on either of the tasks. As discussed above, it was predicted that denials would occur near the middle of the preschool age range, in between Stages I and III. This prediction was tested using criteria 3 and 4, since they isolated Stage II responses without separating Stages I and III. The results showed that, as predicted, the mean age of denials was indeed not significantly different from the mean

age of assertions (t-test). But contrary to predictions, the variance of the ages of denials was not smaller than the variance of the ages of assertions (Bartlett's test for homogeniety of variance). The figures are given in Tables 2 and 3, respectively. In view of the similarity in variances, the lack of difference in the means cannot be interpreted as support for the prediction. Denials did not clearly occur between two periods of assertions, but rather occurred throughout the age range.

TABLE 2

MEAN AGES: STAGES II VERSUS OTHER STAGES

Task	Mean Age, Stage II	N	Mean Age, Other Stages	N	t	df.	p
Liquid, cr. 3	58.8	121	56.0	5	.76	15	N.S.
Liquid, cr. 4	56.0	36	56.4	10	.12	44	N.S.
Wire, cr. 3	59.7	10	56.0	4	.89	12	N.S.
Wire, cr. 4	55.7	24	54.8	23	.35	45	N.S.

TABLE 3

VARIANCES: STAGE II VERSUS OTHER STAGES

Task	Variance, Stage II	N	Variance, Other Stages	N	t	df.	p
Liquid, cr. 3	7.7	12	4.7	5	2.62	11,4	N.S.
Liquid, cr. 4	8.8	36	8.2	10	1.18	35,9	N.S.
Wire, cr. 3	7.5	10	5.4	4	1.89	9,3	N.S.
Wire, cr. 4	9.7	24	7.4	23	1.73	23,22	N.S.

Similar results were found using rank correlations on the first two scoring criteria. Actual correlations could be calculated for these two criteria since they differentiated all three identity stages. The resulting statistics were not significant; children at a higher identity stage, that is, did not tend to be older than children at a lower identity stage. Table 4 gives the Kendall tau correlations that were found.

TABLE 4

TAU CORRELATIONS BETWEEN AGE AND SCORING CRITERION

Scoring Criterion	Liquid	N	p	Wire	N	p
1	-.029	21	N.S.	-.305	20	N.S.
2	-.370	10	N.S.	.154	15	N.S.

The lack of relationship with age may have been caused by sampling too narrow a range of ages. The youngest children in these analyses were three and a half years old. According to Piagetian theory, many children of this age already are behaving at a preoperational level on many or most identity tasks, and therefore can be expected to deny identity. To find children who consistently asserted identity for sensori-motor reasons, sampling might have to extend down to two-year-old children. Likewise, the oldest children in the present study were about six and a half, and many of these may not have been old enough to assert "true" identity consistently. If the age range were

extended upward, it seems likely that an age would eventually be found at which nearly all children expressed the adult, true concept of identity. Future research on reversible identity should therefore include children in the early elementary school years. If possible, it should also include younger children, in spite of the difficulties in interviewing them. If a wider age range could be studied, it seems likely that denials of identity would occur in the middle of it, in between two periods of consistent assertions of identity.

Results for the Plant Task. Partial support for identity development was found for the plant task. Many children showed partial transitivity of identity (Stage II). Of the three questions in the interview, children asserted identity an average of only 1.1 times. Only .20 of the children asserted identity on all three questions; the rest denied the identity of at least one of the pairs of pictures.

In addition, scalogram analysis suggested that the three questions on the plant interview measured points along a unitary scale. The three items on the plant interview had a reproducibility of .99 and an index of consistency of .93, indicating that they formed a Guttman scale significantly better than chance. The following scale types were used for this analysis;

1. Says that pictures No. 1 and 2 (adjacent) are identical.
2. Says that item No. 1 above is true, and that pictures No. 1 and No. 3 are identical.
3. Says that item No. 2 above is true, and that pictures No. 1 and No. 5 (extremes) are identical.

Children who asserted the identity of a more extreme pair, in other words, were very likely also to assert if for a less extreme pair; but the reverse was not true. Such a pattern of responses is consistent with the Piagetian theory of identity development, which asserts that the acceptance of identity for small changes of appearance is necessary, but not sufficient for acceptance of identity for larger changes. The Piagetian concept of partial transitivity, in fact, implies this notion. Age trends, however, were not found. The Kendall tau correlation between age and identity scores was only .02. Age, then, did not determine whether a child asserted the identity of all points in the plant's growth, or only of adjacent points in its growth. As with the liquid and wire tasks, correlations with age could have been hidden because high identity scores might have represented either Stage I or Stage III of identity development. High scores might have been found either early or late in the age range studied; low scores might be expected near the middle. If this pattern occurred, it would reduce the correlation between identity and age; but it should also cause the variances in ages of low scoring children to be smaller than the variance of ages of children at other stages. Bartlett's F-test was used to test this possibility (Winer, 1962, p. 95). Children selected for the high scoring group had identity scores of three, the highest score possible. For the low scoring group, they had identity scores of zero, the lowest possible. The results showed

no significant difference in the variances of the high and low groups (F less than 1.). Low scoring children, then, did not tend to cluster near the middle of the age range, between two high scoring groups.

Here again, the age range of the sample may have been too narrow to reveal the trends that the theory predicted. At some point, after all, it can be assumed that most children acquire the adult, complete notions of identity; the question for research is not whether, but when, this can be said to occur. It seems likely therefore that inclusion of older children in the future research on identity might reveal a definite increase in identity scores in the early elementary school years. It is significant that for non-reversible tasks, Piaget and Voyat studied children as old as eight years. They did not make clear how many children of this age they studied, nor whether they considered this age the typical one for complete acquisition of identity. They did say that acquisition occurs later for nonreversible than for reversible tasks (p. 17); perhaps in fact it occurs after age six and a half, the upper age limit for this study.

Consistently high identity scores might also be revealed by children even younger than the ones in the present study. Such children -- less than three years old -- seem especially likely to assert pseudo identity because of sensori-motor assimilations. The problems of interviewing such young children, however, may prevent this possibility from being tested. By the time children acquire enough language to

answer even simply questions from a strange experimenter, they may already be entering the preoperational period. They may have already begun, therefore, to deny identity sometimes.

Evidence for Gender Identity

Drawing Version. Results for the drawing version of the gender task confirmed DeVries' previous findings of a unitary scale of gender identity that increases with age. Identity scores on this task correlated .58 (Kendall tau, N=31) with age, which reached the .01 level of significance. Scalogram analysis found that the items on the gender identity scale (see Chapter 2) had a reproducibility of .99 and a consistency of .86, which was also significant.

The gender drawing results are particularly important in view of the previous support for them in the studies by DeVries and by Kohlberg. Altogether the evidence suggests that gender identity does indeed develop as Piaget and Voyat might predict. Specifically this development seems to include the following elements:

1. Minimal identity at around age three. At this point the child at least resists the suggestion that gender can change, or he denies, for example, that it might change just because the child wants it to change. This point in development corresponds to Stage II, partial transitivity.

2. Between the ages three and seven, the acquisition of several specific discriminations between apparent changes of gender and real changes of it.

3) Learning of these discriminations in a specific order. First the child learns the difference between the desire to change and real change; later, the difference between specific visual changes and real change; and last, the difference between many visual changes combined, and real change. These steps constitute elements of the development from partial to complete identity.

4) Nearly complete identity at about age seven. At this point most children do not believe that gender can change under any circumstances. This behavior corresponds to Stage III, complete identity.

This account, it should be noted, concerns only the development from partial identity (Stage II) to complete identity (Stage III). Even the youngest children are beginning the preoperational period, when Stage II is supposed to occur. The theory predicts that very young children (age two) would also show complete identity just like the seven-year-olds, but for the younger ones their "identity" would supposedly reflect sensori-motor schemes. This part of the theory was not tested by the gender drawing task.

Film Version. Further evidence for the predictions about gender identity was provided by the "before" part of the film version of the gender task. This set of identity questions correlated significantly with age (.56, Kendall tau), and scalogram analysis yielded a reproducible (.96) and consistent (.56) scale. The questions in the "before" part of the interview formed the following scale types:

1) Says that gender does not change even if the boy wants it to.

2) Says that item No. 1 above is true, and that gender does not change even when the boy grows up.

3) Says that item No. 2 is true, and that gender does not change even by magic.

Each scale type refers to an increasingly remote context in which gender might be thought to change. Each requires apparent-real discriminations similar, but not identical, to those required by the drawing version of the task. Therefore the results are consistent with the interpretation of the gender drawing task given above.

The findings for the "after" and "live" parts of the gender film provided less support for the theory. The correlations with age were both positive ("after" = .28, "live" = .24), but they failed to reach statistical significance. Scalogram analysis found statistically significant scales for both sets of questions. The scale types for the "after" part of the interview were exactly the same as for the "before" part. Those for the "live" part were also the same, except for one addition?

1) Says that the child is the same person as before.

2) Says that item No. 1 above is true, and that the child could not change even if he wanted to.

3) Says that item No. 2 above is true, and that the child could not change even when he grows up.

4) Says that item No. 3 is true, and that the child could not change even by magic.

The Scalogram and correlation statistics are given in Table 5 for all three parts of the gender film task.

TABLE 5

RESULTS OF THE GENDER FILM TASK

Scale	Correlation with Age	Reproducibility	Consistency
"before"	.56*	.96	.56*
"after"	.27	.99	.88*
"live"	.24	.99	.87*

*$p < .05$

The correlations with age for the "after" and "live" parts may have been reduced by the children's seeing the actual transformation of gender on the film. Viewing the change may have given the latter parts of the interview an imaginary, unrealistic quality that made the child conclude that gender changes occur easily, but only on the film. If the boy on the film changed, why not also when he grows up or by magic? Even the oldest children in the sample might think such changes could happen on film without also thinking they could "really" happen. In the "after" and "live" parts of the task, many children may have therefore answered what they thought could happen in movies or in imagination, rather than in real life. A few children, in fact, spontaneously said as much: "I could change in the movies," or "The boy could change in the film." These comments were made not only in the "after" part of the interview, but also in the "live" part, even though those questions supposedly returned to reality, i.e., to the live boy being interviewed.

These considerations suggest that stronger correlations with age could be found for the "live" questions if they were asked before the child saw any apparent change in gender. Future research on gender identity could test this possibility easily by balancing the order of presentation of the two film-related sets of questions with the one "live" set.

Evidence for Race Identity

Drawing Version. Results from the race drawing task also supported the theory of race identity development, though not as clearly as in the case of gender identity. Both parts of the interview -- the drawing-related questions, and the live questions -- correlated significantly with age: .61 and .40, respectively. They all also formed extremely reproducible Guttman scales: reproducibility equalled .96 for the drawing part, and .99 for the live part. While these suggest unitary scales for both, only the live part formed such a scale significantly better than chance (index of consistency = .75).

The "live" part of the race drawing task, then, provided the stronger evidence for race identity development as conceived by Piaget and Voyat and by the present study. The scale types found for this part of the interview were the following:

1) At least resists the suggestion that his own race could change.

2) Does item No. 1 above, and also actually says at some point that his own race cannot change.

3) Does and says No. 2 above, and also says his race cannot change even if he wanted it to.

4) Does and says No. 3 above, and also says his race cannot change even when he grows up.

5) Does and says No. 4 above, and also says his race cannot change my magic.

Except for the first two, these scale types resemble the ones found for the gender film task. Each type represents a stronger belief in race identity, or else a more remote situation in which identity might be thought to change.

Film Version. For the race film task, only the "before" part correlated significantly with age (tau = .53); the other parts correlated positively ("after" = .20, "live" = .18), but did not reach significance. All three parts of the interview formed highly reproducible scales ("before" = .92, "after" = .94, and "live" = .95), but none did so significantly better than chance. These correlation and scalogram statistics are given in Table 6 for all three parts of the race film task.

TABLE 6

RESULTS OF THE RACE FILM TASK

Scale	Correlation with Age	Reproducibility	Consistency
"before"	.53*	.92	.23
"after"	.20	.94	.19
"live"	.18	.95	.09

*$p < .05$

The same explanation for the gender film correlations applies here to the race film correlations. Seeing an apparent race change on the film any have modified the children's interpretations of the questions in the latter parts of the interviews. Many children may have told what they thought

might happen on film or in imagination, rather than in reality. Since the questions for the gender and race tasks paralleled each other, this explanation seems especially plausible.

The scalogram analysis suggests the need for further exploration of the cognitive steps that may lead up to full race identity. The questions, it should be noted, did form highly reproducible scales, but the reproducibility failed to reach statistical significance. While the results therefore did not disconfirm the existence of a unitary dimension of development, they did fail to clarify whether or not the obtained scale types were "really" unified dimensions of race identity development.

Evidence for Correlations

The difference between the reversible and nonreversible tasks necessitated choosing three different types of statistics in testing for relationships between the tasks. Results for the reversible tasks provided nominal scale from scoring criteria No. 3 and No. 4 (i.e., Stage II versus other stages), and ordinal data from criteria No. 1 and No. 2 (Stages I, II, and III in order); the statistics had to be varied accordingly. Results for the nonreversible tasks, though, always provided ordinal data (i.e., identity scores). The following statistics were therefore chosen. For comparing the liquid and wire tasks, Fisher's exact test of independence was used if the data were nominal, and rank correlations (Kendall tau) were used if the data were ordinal. Point bi-serial correlations were used to compare each reversible task (liquid or

wire) with a nonreversible one (plant, gender drawing, or race drawing). Rank correlations were used to measure the degrees of association among the plant, gender drawing, and race drawing tasks, and between the gender and race films. Each type of evidence will be considered below in turn.

Association Between the Liquid and Wire Tasks. The results generally showed a consistent tendency for children to respond at the same stage of development on both the liquid and wire tasks. Though this tendency did not reach statistical significance in most cases, it was consistent enough to suggest that exploration by further identity research might discover more definitive relationships, particularly if larger samples were used.

Fisher's exact test of independence was used to determine whether Stage II responses tended to be given on both tasks. Four-cell contingency tables were constructed in which rows corresponded to one criterion and columns corresponded to another. A child was classified into one of the four cells according to whether or not he gave a Stage II response according to both criteria, to only one of them, or to neither. The basic format for these tables is shown in Table 1.

TABLE 1

CONTINGENCY TABLE FORMAT: STAGE II VERSUS OTHER STAGES

		Wire Task, criterion T: Stage II	Wire Task, criterion T: Other Stages
Liquid Task, criterion X	Stage II	Stage II on both	Stage II on liquid only
	Other Stages	Stage II on wire only	Stage II on neither

Such a table was constructued for every combination of scoring criteria between the tasks -- sixteen tables in all.

In all tables, children tended to respond at Stage II on both criteria, or at some other stage on both criteria. The frequencies in the cells of the tables, in other words, were highest in the upper-left and the lower-right hand cells. This trend held true for all sixteen possible combinations of scoring criteria. The statistical significance by Fisher's exact test was limited, though, by the small sample size of many of the tables.

The trend is clarified by Table 7, which shows the proportions of children responding at Stage II on both tasks. The proportions ranged from .45 to 1.00 depending on which combination of scoring criteria was used to compare the tasks. With three possible identity stages and two tasks, the proportion expected at the same stage by chance is 1/3 x 1/3 =.11. The obtained proportions exceeded this proportion significantly in three cases. The rest failed to reach significance probably because the lack of data for most combinations of scoring criteria.

TABLE 7

PROPORTIONS OF C RESPONDING AT STAGE II ON BOTH THE LIQUID AND THE WIRE TASKS

		Wire Task		
	Cr. 1	Cr. 2	Cr. 3	Cr. 4
Cr. 1	.45 N=11	.63 N=8	.80 N=5	.50* N=20
Cr. 2	.50 N=6	.80 N=5	.75 N=4	.50 N=10

TABLE 7 (cont'd.)

Cr. 3	.50 N=8	.88 N = 8	1.00 N=5	.50* N=16
Cr. 4	.50 N=18	.79 N=14	.64 N=14	.48* N=44

*$p < .05$ by Fisher's exact test.

In addition to these comparisons of Stage II responses, the correlations between tasks were found for the entire sequence of identity stages. Kendall's tau was used, with stages of identity development as levels in the correlations. A high correlation indicated a tendency, first, for the identity stages to appear in the same sequence on both tasks, and second, for the stages to develop at about the same age. The results all showed positive, but not significant, tau correlations between the liquid and wire tasks. These correlations could only be calculated for scoring criteria No. 1 and No. 2 because only these criteria separated all three stages. The statistics are shown in Table 8.

TABLE 8

KENDALL TAU CORRELATIONS BETWEEN LIQUID AND WIRE TASKS

		Wire Task	
		Cr. #1	Cr. #2
Liquid Task	Cr. #1	.433 N=11	.560 N=9
	Cr. #2	.447 N=6	1.000 N=5

Note: None of these correlations is statistically significant.

In spite of the lack of statistical significance for many of these results, the consistency of the trend is important. Every correlation was positive, and every contingency table showed a tendency for Stage II to occur on both tasks. These facts support the original hypothesis that correlations exist among the identity tasks. The sequence of stages of identity development does seem to occur in the same order on both the liquid and wire tasks, although the stages do not seem to depend on chronological age in the age range studied.

Correlations Among the Nonreversible Tasks. Rank correlations of identity scores among the plant, gender drawing, and race drawing tasks are shown in Table 9. The plant task failed to show consistent significant, (or even positive), correlations with the gender or race tasks. The gender task, however, correlated positively with both parts of the race task: .68 with the drawing part, and .38 with the live part. The first of these correlations was also statistically significant. The two parts of the race task correlated postively (.17), but failed to reach significance. The strongest support for a general identity ability, then, was provided by the relationships between the gender and race tasks.

TABLE 9

INTERCORRELATIONS AMONG THE PLANT, GENDER, AND RACE TASKS (STUDY I)

	Plant	Gender	Race (drawing)	Race (line)
Plant	1.000 N=41	.08 N=26	.13 N=15	-.13 N=20
Gender		1.00 N=31	.68* N=16	.38 N=21

TABLE 9 (cont'd.)

Race (drawing)	1.00 N=19	.17 N=13
Race (live)		1.00 N=25

*P<.01

The lack of correlation between the plant and gender tasks and between the plant and race tasks is probably related to the failure of the plant task, discussed earlier, to show age trends. Since the gender and race tasks independently supported the predicted identity development, their failure to correlate with the plant task casts doubt on the validity of the plant task as a measure of qualitative identity. This possibility seems especially likely since the gender task has also been correlated by DeVries and Kohlberg with other non-reversible identity DeVries found significant correlations between the gender task and three other identities: a live form of generic (species) identity task, a picture form of the same task, and a human identity task. Kohlberg also found a significant correlation between the gender task and a generic identity task similar to that used by DeVries.

Unlike these other tasks, the plant task used here did not concern hypothetical identity changes that are made to occur dramatically or quickly. Instead it concerned changes in appearance that in reality stretch over many days or months. It seems likely that many or most preschool children cannot conceive of such long time spans, and therefore do not

understand the identity that is involved. The plant task by Piaget and Voyat, it will be recalled, bypassed this problem by using an artificial plant grown by chemicals with a matter of minutes. This method of testing "plant" identity could not be used in the present study because of the need for more reliable procedures. Pilot studies showed that on each occasion the chemicals used by Piaget and Voyat formed a plant of a different size and shape, and that sometimes they failed to grow any plant at all. Under these circumstances it could not be said that all children were responding to the same stimuli.

In addition to supporting the identity development theory, the correlations between the gender and race drawing tasks suggest that the method of interviewing may influence the extent to which children express their beliefs about identity, and even whether they express any such beliefs at all. The gender drawing task correlated most highly with that part of the race task which used similar questions and materials, namely the drawing-related questions. In both, the questions concerned specific discriminations between apparent and real changes in appearance, and were accompanied by pictures showing these individuals changes. In the "live" part of the race interview, on the other hand, the questions concerned discriminations between apparent and real changes in increasingly remote situations, and they lacked supporting pictures. The questions resembled those in the two film tasks, rather than those in the gender drawing task. Identity scores on the "live" set of questions therefore might have

been expected to correlate most highly with the film tasks. This possibility could not be tested, though, because the two drawing tasks and the two film tasks were given to separate groups of children.

The correlations between the film tasks, shown in Table 10, further suggest that the method of interviewing influences the extent to which children express identity beliefs. All the corresponding parts of the two tasks correlated significantly: "before" with "before," "after" with "after," and "live" with "live." The questions within each pair were identical, as were the sequences in which they were asked.

TABLE 10

INTERCORRELATIONS BETWEEN THE GENDER AND RACE FILM TASKS (STUDY II)
N = 13

		Gender Task:		
Race Task:		Before	After	Live
	Before	.55*	.02	.20
	After	.69*	.26	-.07
	Live	.40	-.13	.60*

*$p < .01$

The correlations between the film tasks do not, however, suggest that gender and race identity form parts of some more genderal qualitative identity development. Except for the correlation between the "before" gender scale and the "live" race scale, none of the correlations was significant; two were even slightly negative. The lack of correlations does not disconfirm the existence of a general qualitative ability

involving race and gender, but it does suggest that the film tasks do not measure the general qualitative identity development that Piaget and Voyat have described. As discussed above, only the "before" part of the gender film not only correlated with age, but also was scalable. Without similar findings for the other parts of the two tasks, no support for a general identity development can be expected from the data. If significant correlations are in fact obtained, they do not refer to an ability that is both unitary and developmental.

Correlations Between the Reversible and Nonreversible Tasks. Point bi-serial correlations between each reversible task and each nonreversible identity scale showed no consistent pattern, and generally were not statistically significant. The results are given in Table 11. For these correlations a reversible task served as one of the variables, and a nonreversible task as the other. The reversible task took on either of two values: a zero if the child responded at Stage II, and a one if he responded in some other stage. The identity scores were used as the values of the nonreversible task. A high positive correlation therefore indicated some tendency for both kinds of Stage II responses -- denial and partial transitivity -- to occur together. These calculations were made using scoring criterion No. 4 of the reversible tasks because the other criteria did not provide enough data for correlational analysis.

TABLE II

POINT BI-SERIAL CORRELATIONS BETWEEN REVERSIBLE AND NONREVERSIBLE TASKS

Nonreversible Task:	Reversible Task: Liquid	Wire	N
Plant	.07	.38*	41
Gender	.34	.26	23
Race (drawing)	.30	-.18	19
Race (live)	-.01	.07	23

*$p < .05$

Though the table as a whole shows no pattern, note that moderately positive correlations were found between the tasks that showed the most support for qualitative identity development: the gender, liquid, and wire tasks. Between the gender and liquid task, the correlation was .34 and approached ($p = .06$) significance; between the gender and the wire task, it was .26. As discussed above, the liquid and wire tasks also showed a consistent tendency to correlate. Altogether, these findings suggest that a general ability of qualitative identity may exist for these three tasks. A larger sample of data, though, is needed to test this possibility more clearly.

Decalages

The results permit inferences about decalages only for four of the tasks used in the study. In the cognitive developmental theoretical framework used here, "decalage" has no meaning for tasks that fail to show unitary developmental

trends; in this study, accordingly, decalages could not be considered for the liquid, wire, and plant tasks, nor for those parts of the gender and race tasks that failed to show age trends. Differences in timing were considered only among the remaining tasks: gender drawing, race "live" drawing, gender film "before," and race film "before."

The average age of acquisition of Stage III, true identity, was compared among these tasks. Stage III was defined as a high identity score, and specifically as either asserting a belief in identity on every question in the interview, or on every question except one. While in principle this criterion might classify some pseudo identities as true ones, this possibility seemed unlikely in view of the strong correlations of these tasks with age. Only the older children asserted identity consistently, and these seemed unlikely to do so for sensori-motor (i.e., Stage I) reasons.

The average ages of achievement of Stage III by these criteria are shown in Table 12. The table suggests that identity is acquired earlier for the two drawing tasks than for the two film tasks. A t-test between the combined drawing tasks and the combined film tasks, however, failed to reach statistical significance ($t = 2.$, $df = 57$).

TABLE 12

AVERAGE AGES OF STAGE III RESPONSES

Task	Age in Months	s.d.	N
Gender drawing	62.2	7.4	5
Gender film, "before"	70.5	10.0	19

TABLE 12 (cont'd.)

Race "live" drawing	57.3	6.3	13
Race film, "before"	69.5	12.6	12

The tentative difference between the drawing tasks and the film tasks could have been caused by differences in the tasks themselves -- for instance, by the greater realism of the child portrayed in the films. There is, however, no theoretically based reason to expect the nature of these specific tasks to cause differences in the ages of attainment. The decalage therefore seems more plausibly explained by the wider range of ages used for the film tasks. By using more children of older ages, the film tasks could be expected to discover more children who achieve Stage III at older ages; this fact would account for a higher average age of attainment on the film tasks.

The results in Table 11 do not test the major prediction about decalages made by Piaget and Voyat: that nonreversible identities are acquired later than reversible ones. This idea can only be tested if age trends are found for reversible tasks. Although such trends were not found by this study, they still seem possible if, as discussed earlier, a wider range of ages is included.

CHAPTER 4

SUMMARY AND CONCLUSIONS

Purpose of the Study. This study examined several aspects of qualitative identity, the ability to differentiate the permanent and changeable aspects of an object. Research by Piaget and Voyat (1968) predicted that identity would develop through a particular sequence of stages, with certain differences for tasks involving reversible and nonreversible changes. In tasks involving reversible changes, the object would first be responded to in sensori-motor terms. The child would therefore assert that the object remained the same despite changes in its appearance, because the same variety of actions can always be performed on it. At the next stage, the child notices perceptual changes, but his thinking is dominated by them. When the object changes appearance, the child denies that it is the same object as before; changing appearance makes it a whole new object. At the third stage, the child can simultaneously perceive the changed and constant attributes of the object; now he says the object stays the same, but it only looks different when it changes. This behavior defines qualitative identity. Similar stages were predicted by Piaget and Voyat to occur in tasks involving nonreversible changes, except that the second stage consisted of "partial transitivity" rather than of denial of identity. In partial transitivity, the child asserts identity if the object changes only a little, but not if it changes a lot.

The present study sought to remedy the limitations of the original research by Piaget and Voyat about the development of qualitative identity. First, the definitions of the stages were made more specific; second, the theory of identity development was extended to two new areas of socialization, namely race and gender; and third, correlations and decalages among specific identity tasks were considered. Studies on gender identity by Kohlberg (1966) and DeVries (1968) were replicated and related to the other identity tasks studied here.

Methods. Seven tasks were selected for study. Two were replications of tasks used by Piaget and Voyat involving changes in objects that were empirically reversible. In one of these, a liquid was poured from a tall, thin container to a short, wide one; and in the other, a straight wire was bent. The third task was a modification of a task by Piaget and Voyat involving a change that was nonreversible. In the modified form used here, the task concerned the growth of a plant presented in a series of drawings. The fourth and fifth tasks concerned race and gender identity. One used a series of drawings of a child who seemed to change his race; and the other, a series of drawings of a child who seemed to change his gender. The last (sixth and seventh) tasks also concerned race and gender identity, but they used films of the race and gender changes, rather than drawings, and they used a separate group of children. Subjects on all tasks were white, middle-class boys.

Responses to the two reversible tasks -- the liquid and the wire -- were classified into the three stages described above. Responses to the remaining five tasks -- the nonreversible ones -- were classified according to their identity scores, which were defined as the number of questions on which a child asserted a belief in identity.

Results. On every task, children responded at all the different stages of development predicted by Piaget and Voyat. The most interesting corollary to this finding was that Stage II occurred on all the tasks. Many children, in other words, denied the identity of the liquid or of the wire after it changed appearance; many denied identity of the plant if it grew more than just a little; and many believed that race and gender could change under certain circumstances.

Significant relationships with age, however, were shown only by the gender drawing task, by the "live" part of the race drawing task, and by the "before" parts of the gender and race film tasks. These tasks, or parts of tasks, also showed significant unitary scales of development, a fact that suggested a hierarchy of steps in development consistent with Piagetian stage theory. Interestingly, no relationships with age were found for the original tasks used by Piaget and Voyat -- the liquid, wire, and plant tasks. Positive correlations were found between the liquid and wire tasks, between the gender and race drawing tasks, and between the gender and race film tasks. Many of these correlations were also statistically significant. Positive correlations were not consistently found, however, between each reversible (liquid, wire) and

nonreversible (plant, gender, race) task. Decalages could not be fully considered because of the lack of age trends for many of the tasks.

Conclusions. The gender and race tasks generally supported the theory of identity development proposed by Piaget and Voyat. The chief alternative viewpoint, social learning theory, cannot account for the many clear denials of identity that the children made, nor for the orderliness with which they seemed to acquire the elements of the identity concepts. The results for the liquid, wire, and plant tasks, however, failed to support either a Piagetian or a social learning interpretation. On these tasks children seemed to express simple response biases, but no developmental trends were found. Since these tasks were derived from the original research by Piaget and Voyat, their failure to show age trends in the present study deserves special attention. Some explanations for the findings are suggested below. First, however, the gender and race results are discussed.

The strongest support for the Piagetian theory of identity development was provided by the gender and race tasks. On each of these, many children said or implied that gender or race could change under certain circumstances. Younger children tended to believe it could change more easily than did older children, and by age six, most children asserted complete constancy of gender and of race. The interview questions formed unitary scales for each part of the tasks. They did so significantly better than chance on the gender drawing task,

the "live" part of the race drawing task, and the "before" parts of the film tasks. The existence of these scales suggests that the identities are acquired by a series of hierarchical stages consistent with Piagetian theory: some elements of gender and race identity are always acquired first, and are necessary conditions for learning the later elements.

It is hard to see how social learning theory could account for these results. On most of the interview questions, many children actively denied that gender or race remain constant. Usually, however, children are not reinforced for denying identity, nor do children usually observe adults doing so, from whom they might model their own behavior. Instead adults usually assert that gender and race are completely constant, and they reinforce children for approximating similar beliefs. The ambiguous and contradictory responses found in the present study might be considered such approximations, and thus might be accounted for by social learning theory. But it is hard to construe the flat denials that were found as "approximations" to true identity beliefs. How could such behavior ever be modeled, and how could it ever be converted to its opposite by reinforcing successive approximations?

Social learning theory also seems implausible for interpreting the scalogram results for these tasks. If the elements of a belief in gender or race identity are learned by the mechanisms of observation or operant conditioning, there would be no reason to expect the elements always to be learned in a particular order. In acquiring gender identity, for example,

the first idea that one child learns might be that "a boy cannot change sex just by wanting to"; but the first that another child learns might be that "a boy cannot change sex by changing his hairdo." The order in which the elements of gender identity are learned would vary with the particular circumstances of the child's social environment. Instead of a random order of acquisition, however, the results suggest that the elements of gender and race identity are acquired in a particular order for all children. Certain specific identity beliefs were held only if others were also held, and older children seemed to hold more of the elements of gender and race identity than did younger children.

In view of the scalogram results, the positive correlations between the gender and race tasks are best interpreted as supporting the theory of identity proposed by Piaget and Voyat. In this view, the correlations are expected because a child develops a general cognitive ability, qualitative identity, that is applied equally to all identity tasks. As the child acquires this ability, it structures all of his thinking about identities more and more -- including in this case his thinking about race and gender. By themselves, of course, the positive correlations between the gender and race tasks are also consistent with social learning theory. In this alternative view, children acquire more and more identity beliefs as they grow older; their identity scores should therefore rise on all identity tasks together, causing positive correlations. Since, however, this explanation does not account for the high

scalability of the responses, the Piagetian explanation of the correlations seems more reasonable.

Little support for the Piagetian point of view, however, was found for the other three tasks -- the liquid, wire, and plant tasks. A variety of responses was found on each of these, but the responses showed no relationships to age. For the liquid and wire tasks, the denials of identity did not tend to cluster near the middle of the age range, as was predicted; for the plant task, older children did not tend to express more complete beliefs in the identity of the plant during its growth cycle.

Possibly some children did not understand the interview questions on these tasks, and therefore gave responses unrelated to their beliefs about identity. Language response biases may have determined their answers to the questions. Such biases, for example, may have caused some children to answer "no" to a straight-forward question like, "Is it the same wire now?"

Evidence from the liquid and wire tasks tends to support this possibility. Denials of identity were not always made consistently. On these two tasks, it will be recalled, the questions were phrased so as to reduce the possibility of language response bias. On one question the child was asked whether it was the "same object as before," and on another he was asked whether it was a "new object now." On yet another, he was asked whether the object was just as much or as long as before. To be consistent, the child had to answer two of these questions in the affirmative and one in the negative, or vice versa; but

he could not answer them all the same way. The results showed that the proportion of children denying identity consistently on all of these questions was much lower than the proportion denying identity only on the first question (see criteria #3 and #4, Table 1). It seems likely therefore that many of the children who denied identity on the first question did not understand the question enough to change their response when the question was rephrased.

The hypothesis of response biases, however, does not completely explain the results. First, it does not explain why children apparently did answer the interview questions meaningfully on the gender and race identity tasks. The inconsistency is particularly apparent between the plant task and the gender and race tasks, since all of these used similar content and procedures. The plant, gender, and race tasks all concerned nonreversible identities, and the questions on each task concerned various amounts of change in the attributes of an object. Responses on all the tasks tended to form sequential, unitary scales consistent with Piagetian theory. Yet only on the gender and race tasks, did identity tend to increase with age.

Second, the hypothesis of response biases does not explain why some children did in fact deny identity consistently on the liquid and wire tasks. These children apparently did understand the identity questions no matter how they were phrased, yet they still said or implied that the liquid became a new liquid when it was poured, or that the wire became

a new wire when it was bent. As discussed above, social learning theory cannot account for such responses, though they are consistent with the theory of identity proposed by Piaget and Voyat. According to the latter viewpoint, denials of identity are expected by children at Stage II of development, during which their thinking is supposed to be dominated by visual changes in the object.

Possibly for the liquid, wire, and plant tasks, the range of ages was too narrow to reveal the relationships that were predicted. The lower age limit of the sample -- 34 months -- may not have been low enough to include many children who would express action-based beliefs in identity. Likewise, the upper age limit -- 62 months -- may not have been high enough to include many children who have learned to distinguish changeable from permanent qualities of an object. If the range of ages were extended in both directions, children at Stage II may be found to cluster near the middle of the range. On the liquid and wire tasks, denials of identity may tend to cluster around age four, the middle of the extended age range; and on the plant task, partial transitivity of identity may tend to occur at about this same age.

There are two problems with this proposal, one theoretical and one practical. First, if the range of ages was too narrow on the liquid, wire, and plant tasks, why was it apparently broad enough to yield positive correlations with age on the gender and race tasks? A possible answer is that gender and race identities are developed more quickly than the other

identities, and therefore age trends can be observed even within a restricted range of ages. This finding might be explained by a psychodynamic theory as the result of the greater emotional content of the gender and race identities. The sexual and social feelings tied to these concepts might motivate children to acquire them faster than the neutral concepts of liquid, wire, and plant identities.

The gender research by Kohlberg, however, failed to support this psychodynamic explanation (1968, p. 98). He found that gender identity developed in parallel with two conservation tasks that were emotionally neutral -- conservation of the mass of a piece of clay, and conservation of the length of a piece of chewing gum. The level of gender identity correlated highly ($r = .50$ to $.70$) with the existence of these conservation abilities. It should be noted, however, that similar results might not be found using neutral identity tasks, rather than neutral conservation tasks. Since identity involves less cognitive structure or development than conservation, acquiring identity may be influenced more by feelings about the particular identity task. This possibility has not been tested.

The second problem with extending the range of ages is more practical. How can identity beliefs be determined reliably among two-year-old children? Since these children have barely learned to talk, the experimenter will be fortunate to receive meaningful answer to simple, yes-no questions. Getting verbal explanations for their beliefs would be nearly impossible. Since two-year-olds are still guided heavily by actions rather

than language, their beliefs and justifications would have to be inferred from their behavior, rather than from what they say. Piaget's concept of "pseudo identity" implies that this kind of identity is expressed in actions rather than in words. If the child can use words to express his identity beliefs, in fact, he may have already moved beyond the initial sensori-motor stage of identity development. It should be recalled that Piaget's children at Stage I did not give any verbal reasons for their identity beliefs.

This methodological problem may have reduced the correlations of the liquid and wire tasks with age in the present study. Only verbal responses were accepted as evidence for a child's stage of development. Therefore responses classified as Stage I, in which identity was supposedly based on actions, may not have been valid assertions of action-based identity. If so, there would be no reason to expect them to cluster near the lower end of the age range, as predicted, and any correlation with age may have been thereby reduced.

This study of qualitative identity, then, suggests that gender and race identity are acquired by a series of developmental steps consistent with Piagetian theory; but it does not support this theory for the liquid, wire, and plant identities. Since the latter involves the tasks on which Piaget and Voyat originally based their conclusions, further study of them seems needed to clarify the inconsistencies between their findings and the present ones. Two directions for further study seem especially promising: extending the range of ages,

and finding nonverbal methods for measuring the pseudo identity of very young children.

In addition, other questions about identity development need to be answered. Some of these were raised in Chapter 3 in the discussions of the results. Do ambiguous and contradictory responses show separate and opposing correlations with age? Is identity acquired earlier for reversible tasks than for nonreversible ones, as Piaget predicts? In the film tasks, does viewing the gender or race change cause the child to suspend his true identity beliefs, and to respond as if the situation were imaginary? Can a theory of race identity be constructed similar to Kohlberg's theory of sex-role development? What, for example, is the relationship between race identity as studied here and racial attitudes and preferences? What does a Piagetian theory of identity development imply for educational practice? Answers to questions like these will provide the information for a more thorough and empirically based theory of the development of qualitative identity.

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