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Children's Understanding of Racial Classifications as a Function of Their Knowledge of Inheritance

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CHILDREN’S UNDERSTANDING OF RACIAL CLASSIFICATIONS AS A 
FUNCTION OF THEIR KNOWLEDGE OF INHERITANCE

A Thesis
Presented to
The Faculty of the Department of Psychology
Western Kentucky University
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Of the Requirements for the Degree
Specialist in Education of School Psychology

By
Jason N. Glerum
August 2002
CHILDREN'S UNDERSTANDING OF RACIAL CLASSIFICATION AS A FUNCTION OF THEIR KNOWLEDGE OF INHERITANCE

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CHILDREN’S UNDERSTANDING OF RACIAL CLASSIFICATION AS A FUNCTION OF THEIR KNOWLEDGE OF INHERITANCE

Jason N. Glerum August 2002 51 Pages

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Many studies have examined how children categorize various objects but few studies have looked at how children categorize race. Research shows that adults tend to essentialize race; that is, they treat race as a natural kind (Madole, Keleman, Glerum & Webb, 1999). Do children treat race in the same manner? This study examines how preschool children, second grade children, and fourth grade children treat race. Children were presented with stories and pictures describing a transformation to a person’s racial characteristics (that is, a change in external appearance from white to black or black to white features) and asked to what category the person belonged after the changes. To examine whether children treat race more like a biological change or an artifact change, similar stories described changes to animals and to artifacts. It was hypothesized that the development of essentialization is related to an acquired knowledge of inheritance. Results showed that essentialization of racial categories follows a developmental progression in which preschool children do not essentialize race, some second grade students have started to essentialize race, and a greater number of fourth graders essentialize race. The introduction of inheritance did not significantly affect children’s essentialization of race. Overall, some hypotheses were confirmed, others were disconfirmed, and some unexpected results were found.
I. Introduction

The ability to categorize is a fundamental process of human cognition, and is therefore one of the foremost areas of research for psychologists. Without the ability to categorize, the world would be overwhelmingly complex. Imagine the need to respond differently to every object encountered instead of being able to recognize exemplars of categories that encompass a wide range of known and novel objects. If every person, every object, every event, and every experience needed to be identified and dealt with as individual instances instead of representations of categories, the world would be incomprehensible. Categorization allows us to order and simplify our world by reducing the complexity to a manageable and efficient system of categories and sub-categories and by allowing us to make inductive inferences about objects that we encounter (Gelman, 1988). For example, there are many chairs in our world, but we do not treat each kind of chair as a new object. Instead, when people encounter a chair in their environment it is usually quickly recognized and mentally pigeonholed into the “chair” category. Adults seem to recognize certain features shared by exemplars of the chair category and are able to induce the object’s category membership.

Nominal Kinds, Natural Kinds, and Artifacts

Objects in our world can be broken into three distinct conceptual representations, or kinds of categories: nominal kinds, artifacts, and natural kinds. Schwartz (1979) defines a nominal kind as “…any term which gathers its extension not by an underlying trait but by a list of semantically associated descriptive properties (p. 310).” Schwartz proposes that nominal kinds are defined by a list of necessary and
sufficient characteristics. For an example, an uncle may have many features (a beard, a jovial disposition, a habit of giving terrible gifts), but these features are only characteristic of some uncles, none of these is necessary for a person to fit the definition of an uncle, nor are they sufficient to define the concept of uncle. The necessary characteristics are that (a) the person is male, and (b) that he is the sibling of a child’s parent; without these two characteristics, the person is not an “uncle.” These two characteristics combined are also sufficient; that is, only these two facts need to be present for a person to be an uncle.

In this paper, I am primarily concerned with the next two kinds of categories: artifacts and natural kinds. Artifacts are created objects that depend upon function for their identity (Keil, 1989); that is, artifacts are defined by how they are used, their characteristic actions, or the intended purpose of the creator (Madole, 1993; Nelson, 1979; Richards, Goldfarb, Richards, & Hassen, 1989). When the function of an artifact changes, adults will treat the artifact as a member of a different category. An example of an artifact is a coffeepot. As long as it is used to make or hold coffee, we believe that it is, in fact, a coffeepot. However, if we make some simple changes to the object (e.g., fill it with birdseed and hang it somewhere accessible to birds), it can become a birdfeeder. When changes are made to the function of an artifact the artifact may change categories.

Schwartz (1979) defines “natural kind” more precisely as any term that derives its meaning only from an underlying trait (that is, its “essence”). Examples of natural kinds are those things that occur naturally in the world around us (ergo, “natural” kinds), such as animals and plants. We may not know for sure what makes a cat a
cat, but there is an underlying property or trait that gives the cat its “catness.”

*Essentialist Thinking About Natural Kinds*

Philosophers tend to debate the existence of essences. For psychologists, however, (e.g., Medin and Ortony) the actual existence of essences is less important than people's beliefs in the existence of essences. Psychological essentialism refers to the idea that people form representations of objects that include the belief (correct or incorrect) that some objects (i.e., natural kinds) have internal, perhaps unknown, essences that make the objects what they are. These essences may or may not actually exist, but the belief that they exist is important in forming representations of objects (Medin & Ortony, 1989). In other words, people treat natural kinds as if they believe that these kinds of objects have “essences” that are not always immediately discernable, something that goes beyond what is superficially apparent (Keil, 1989). We define the instance of a natural kind according to this presumed essence. Keil (1989) adds that people tend to treat natural kinds in ways that preserve their kind across superficial transformations; that is, people believe natural kinds resist changes in category membership, even if the entity's appearance changes dramatically.

Psychological essentialism is an important concept in understanding category formation. A commonly used paradigm for studying essentialist thinking is to present participants with brief stories that describe a change in the appearance of an object so that it has all of the superficial characteristics of another object (e.g., a raccoon changed in appearance to resemble a skunk). Stories are accompanied by “before” and “after” pictures. Participants are then asked whether the object is still an instance of the original category, or now an instance of the "new" category (e.g., "Is this
animal now a skunk or is it still a raccoon?”). Essentialist thinking is reflected in a
tendency to deny that the object has changed its category membership. Results of
studies using this method (e.g., Keil, 1989) have shown that people tend to
essentialize natural categories (e.g., humans and birds), but not artifact categories
(e.g., coffee pots and bird feeders).

Adults tend to categorize natural kinds based upon presumed essences; do children
as well? The answer to that question is embedded within the larger question of how
children develop categories. One current, major debate in the area of category
development concerns the roles of perceptual and conceptual features. Perceptual
features are those things that we derive from sensory experiences, for example, seeing
that a bird has a beak, hearing that a bird sings, or feeling that a bird has soft feathers.
Conceptual features, on the other hand, refer to the representations that we form of
our environment -- that is, to more abstract relationships and non-visible features.
For example, a toy poodle and a bull mastiff are both dogs despite glaring perceptual
differences. Two basic differing opinions exist in the current literature. One position
maintains that humans have the ability to form conceptual categories from infancy,
and that categorization occurs at a conceptual level from early in life (Hirschfeld,
1994, 1995; Mandler, 1993). The other view maintains that the formation of
categories is a process of gathering perceptual information that evolves into concepts
as more and more information becomes available (Madole & Oakes, 1999).

Some psychologists postulate that the developmental changes from perceptually-
based representations to conceptually-based representations are more a qualitative
shift than a quantitative shift (Hirschfeld, 1994; Keil, 1989; Mandler, 1993). This
Position divides conceptualization and perception into dichotomous processes, which either do not overlap (Keil, 1991) or that are mediated by a complex process of redescription that Mandler (1993) calls “perceptual analysis.” According to Mandler, “perceptual analysis” is a process that transforms the rudimentary perceptual patterns that stem from the sensory information available to infants and children into a more sophisticated conceptual format. Mandler claims that concepts have “… a non-perceptual core. . . (p. 142)”, which leads to the bemusing conclusion that concepts must then spring from other concepts. This perspective de-emphasizes the role of perception in conceptual category formation, holding that infants have an a priori ability to form concepts without relying solely upon perceptual -- a classic case of which comes first, the chicken, or the egg.

Other psychologists argue that the shift from perceptual discrimination to conceptual theorization is based upon the increasing quantity of knowledge available to the developing child, rather than a qualitative structural shift (Jones & Smith, 1993; Madole & Oakes, 1999; Springer, 1996). The developing child, according to this viewpoint, is expert at the induction of correlations based upon available and repeated perceptual cues. The child develops conceptual theories through observations of increasingly complex correlations. Madole and Oakes (1999) argue that “… one of the most critical aspects of developmental change in infants’ categorization is their increasing attention to abstract features of objects and their recognition of the relationship between abstract features and perceptual features (p. 272).” To illustrate, imagine a child who notices that an object called “bird” has a beak, has feathers, and can fly. Every time something that is called “bird” appears, the child takes note that
it, too, has a beak, has feathers and can fly. Soon the child begins to form a concept of “bird - an object that has a beak, has feathers, and can fly.” As this child develops, she attends not only to perceptual features of the category “bird” (e.g., can fly, has a beak, has feathers, etc.) but also to abstract features (e.g., has common organs, migrates, has bird genetics, etc.). Over time, the child perceives more details regarding this concept of “bird,” the amount of knowledge available to the child grows, and the concept of bird becomes more complex and theory-like. The child formulates a concept of bird “essence”, which includes some internal criterion of “birdness” that allows a robin, a parrot, an ostrich, and a penguin to each fall into that category despite perceptual differences. This process involves a shift from perceptually based inference to conceptually based inference – as more information becomes available to the child.

*Children and Essentialist Beliefs*

Children seem to show some belief in the existence of essential properties. A study by Gelman and Markman (1987) suggests that even 3 year-old children have knowledge that natural kind category membership includes more than superficial features, and that category membership is more relevant to children’s inferences than are perceptual features. In other words, even children as young as 3 years old essentialize natural kind categories to an extent. Similarly, Keil (1989) conducted a study in which a transformation to an artifact or a natural object was described. For example, doctors change various aspects of a raccoon (e.g., paint a stripe on it, add an odor gland) and show before and after pictures (raccoon and skunk). Children were then questioned as to which category they believed the animal belongs. Artifact
examples were presented in the same manner. Keil found that, when presented with stories in which a raccoon is surgically transformed so that it has the appearance of a skunk, children as young as 7 years of age will deny that the animal is now a skunk (Keil, 1989).

The fact that children essentialize many natural kind categories does not automatically indicate that even young children are using only conceptual thinking. Treating perception and conception as inextricably locked in a reciprocal relationship is logically more palatable than treating them as separate entities. Even adults make mistakes that indicate the interactive nature of conception and perception. For example, adults make conceptual mistakes based upon perceptual information (e.g., a dolphin as a fish rather than a mammal, a tomato as a vegetable rather than a fruit, etc.) but will modify their conceptualizations based upon discovered information. This new information, in turn, will modify perceptions (e.g., we now inescapably see that, indeed, the dolphin has a blowhole for breathing air like a mammal rather than gills to breathe as a fish). This type of “initial mistake + new information = modification” relationship strongly suggests an interaction between perceptual and conceptual processing that is mediated by the available quantity or quality of information.

Children, Race, and Essentialism

While a large literature exists on the development of object categorization (Mandler, 1993; Younger, 1993; also see Keil, 1989 and Madole & Oakes, 1999 for reviews), there has been little research examining children’s development of racial categorization (Madole & Oakes, 1999). Racial categories are familiar to all of us,
yet the manner in which those categories are formed is relatively unknown (Madole et al., 1999). Do children go through developmental stages in their formation of racial categories? Of the studies that have examined this question, few give concrete information about the process of children’s acquisition of adult-like racial categorization.

How do children categorize race? The answer to that question varies according to different research. In a series of studies, Hirschfeld (1995) finds support for his belief that children have an adult-like theory of race from a very young age -- that is, that even very young children essentialize race. His work seems to support the claim that children as young as three years of age believe that a person’s race is unalterable but, interestingly, that their bodies are not. He reports that “By 4 years of age children believe that race is fixed by birth, expecting the inheritance of racial features to be mediated by biological reproduction. In short, preschoolers demonstrate a biologically grounded understanding of race (p. 240).”

Hirschfeld’s work consistently finds evidence for a precocious understanding of race and biology. His methodology, however, leads to questions as to what the findings truly indicate regarding race and biology. For example, in a series of studies exploring the development of racial conceptualization, Hirschfeld (1995) uses drawings of figures as stimuli to depict several changes in a person’s appearance. Examining previous research, Hirschfeld discusses that a drawback in previous studies was that the kinds of properties that were being manipulated, skin color for example, were familiar to children, but the actual transformations presented were outside children’s realm of experience; that is, children never see a person of
Caucasian appearance change into a person of African-American appearance. Says Hirschfeld: “Previous work may thus underestimate young children’s knowledge of identity constancy because subjects have been asked to reason about personal identity in the face of unfamiliar changes in a person’s appearance” (pp. 218-219). Yet, saying that, he then immediately describes a study of his own in which the stimuli used lack realism. The kind of human transformations presented are within children’s experience, but other transformations that he used are not; a normal car transformed into a “fat” car is not something with which children are familiar. Madole and Oakes (1999) present a summary of literature demonstrating that the realism of a given stimulus directly affects the responses given by children. It is questionable whether Hirschfeld’s stimuli are realistic enough to elicit responses representative of children’s understanding and actual knowledge applied to people and objects in their environment.

In contrast to Hirschfeld, others researchers cite evidence in support of a gradual development of racial categories and believe that young children respond purely to perceptual cues of race rather than an underlying knowledge of genetics and an adult-like essentialization (Aboud, 1988; Semaj, 1980). Semaj (1980) reports results from a study that probed race constancy in African-American children. The findings suggest that mastery of racial constancy does not occur until sometime after age 11 (the oldest sample in the study). Semaj reports that only 40% of the 10-11 year-old children in the study maintained racial constancy when the stimulus’ skin and hair color were altered. In other words, children as old as 11 did not essentialize race reliably. However, Madole et al. (1999) report that nearly all adults believed that,
despite changes in appearance, the stimulus person’s race had not changed.

In the Madole et al. 1999 study, adults were presented with a packet containing various stories that described permanent changes to a person’s gender, a person’s race, a person’s hair length, an animal’s species, or an object’s appearance and function. The stories were accompanied by pictures to illustrate the changes described. The results obtained by this study indicate that adults tend to think of race as a natural kind, that is, immutable and essential to identity (Madole et al., 1999). In fact, adults were more likely to indicate that a person could change their gender than change racial categories!

Do children tend to view race as belonging to a category other than natural kinds? That is, are they willing to say that an individual can change race by changing appearance? Somewhere along the way, children learn that race is more than the perception of skin color and begin to form a theory; they begin to conceptualize race. At what point, however, do they begin to make that transition? I think that it has to do, at least in part, with a child’s developing understanding that race is genetically based. Clark, Hocevar, and Dembo (1980) found support for the hypothesis that children’s explanations of skin color go through a predictable developmental sequence, ranging from supernaturalism (God made them that way) to physicalism (genetic causes). They also found support for the hypothesis that developmental prerequisites for an adult theory-like understanding of the origins of skin color include understanding physical conservation, understanding that phenomena have physical causes, and understanding that one’s identity does not change with age. These comprehension levels match with a developing understanding of inheritance.
Many researchers have demonstrated that race constancy develops somewhat later than gender constancy, but tends to correlate with the same Piagetian stages gender constancy does (Aboud, 1983; Bem, 1989; Clark et al., 1980; Semaj, 1980). In a study examining children’s perceptions of ethnic constancy, Aboud (1983) found evidence that suggests that children do not acquire a consistent or confident knowledge of ethnic constancy before age 8. She also found two other cognitive abilities that correlated with the development of ethnic constancy: ethnic permanence (knowledge of the unchangeable nature of ethnicity), and conservation.

Alejandro-Wright (1985) points out that many researchers define a child’s ability to apply racial terms as an ability to classify racially. However, she makes the case that the ability to apply racial terms falls short of true racial classification in that this task only requires identification (“give me the white/black/etc. dolly) not actual classification (grouping similar things). She used a series of interviews in which children were given a spontaneous classification task, a structured classification task, and a probing task. She demonstrated that younger children (two groups in her study: 3-4 year olds and 5-6 year olds) show a tendency to spontaneously group people using criteria other than race or skin color. Even when older children (8-10 years of age) begin to spontaneously categorize by racial category, they show a tendency to use labels other than the socialized adult labels.

So, what exactly is it that triggers a developmental understanding of race? In light of the studies suggesting that race constancy and gender constancy are developmentally correlated (Aboud, 1983; Bem, 1989; Clark et al., 1990; Semaj, 1980), it makes sense to take a brief look at gender constancy for clues as to what
type of information may contribute to race constancy. Bem (1989) discusses previous measures of gender constancy and demonstrates that the traditional methods are subject to misinterpretation; they fail to truly test gender conservation across perceptual transformation, or are artificial. The previous studies do not address any underlying biological knowledge that children may have regarding what makes someone in “essence” a boy or a girl. She developed a new measure for gender constancy in a study that involved children’s knowledge of genitalia as a measure for gender constancy. Her results indicate that gender constancy is not so much purely a developmental stage (as previous researchers believed) as it is a simple matter of (a) a knowledge of genital differences in boys and girls and (b) the knowledge that genital cues are more important than social cues for gender identity. This combination of knowledge, specific to the domain of sexual identity, is the crucial piece for development of gender constancy.

What, then, is the domain-specific piece of knowledge that leads to the development of race constancy? I hypothesize that children’s knowledge of inheritance will play an important role. Studies indicate that even preschool aged children have biological knowledge of inheritance (Springer & Keil, 1989) and distinguish between biological and social domains (Springer, 1992). The second point is consistent with Bem’s (1989) findings that children need not only to be aware of biological genital differences but, importantly, must also understand that biological domains take precedence over social domains. Springer (1992) also reports that children will base their inductions upon physical similarity when no information regarding kinship is given. When kinship is introduced, they judge it as more
relevant than physical similarity, and will preferentially base their inductions upon kinship. In addition, he indicates that social relationship is not considered as salient for children as is kinship.

Do young children automatically view race as an immutable, essential component of identity, or do they gradually develop a preference for essentializing race? More specifically, do children have an innate tendency to essentialize race or is it something that is developed as they gain experience and knowledge of the world? Based upon the research by Bern (1989), Spring (1992), and Springer and Keil (1989), I hypothesize several possible findings: first, if children view race as a biological concept (a natural kind), and they also understand the concept of inheritance, they will be more likely to essentialize it when presented with inheritance information. If children view race as only a social concept, they will less likely believe it is inheritable, and by extension, less likely to essentialize it. Second, if children understand inheritance, then the physical similarities or differences of socially related individuals will have less impact than the physical similarities or differences of biologically related individuals. Thus if children are presented with a change in racial appearance and in addition are presented with information relating to inheritance (e.g., pictures of parents) they will be more likely to hold views of race constancy. Third, as children age, they will increasingly view race as a biological concept and begin to comprehend inheritance and its impact on natural kind transformations. These increasing awarenesses will impact their theories of racial categorization, which will look more and more adult-like with increasing age.

The study proposed here is an extension of one designed and implemented by Madole et al. (1999), which explored the conditions under which adults essentialize
the social categories of race and sex. Madole points out that little attention has been devoted to examining adult essentialist beliefs regarding social categories. This study will examine the conditions under which children essentialize the social category of race, essentially replicating the Madole et al., (1999) study with children. Children were presented with modifications of stories used by Madole, excluding those describing sex transformations. The criterion stories and pictures described a racial appearance change (black to white or white to black), and children were asked to identify the person’s post-change category membership.
II. Method

Participants

Students from preschools and elementary schools in the Bowling Green, Kentucky vicinity participated in the study. The first age group, twenty three- and four-year-olds, were recruited from a Montessori preschool. The second age group, eighteen seven- and eight-year-olds (roughly second grade, some from the first grade), and the third age group, eighteen nine- and ten-year-olds (roughly fourth grade, some from the third grade) were recruited from a public elementary school. We contacted the local school board for permission to conduct the study within the school system. One elementary school principal volunteered to allow the research to be conducted in her school. Teachers were contacted for permission to conduct the study within specific classrooms. Permission to conduct research at the preschool was obtained from the director. Parents of the students were contacted through a letter sent home with the children (see Appendix B). The letter emphasized that participation was voluntary and that children would receive a small token (a Western Kentucky University pencil) for returning the consent forms. The token was presented for the return of the form and was not contingent upon willingness to participate. Students at each age level, with parental consent to participate, were randomly selected and assigned to one of the two conditions, counterbalanced for gender. All procedures were approved by the Human Subjects Review Board of Western Kentucky University.

Stimuli

The interviewer presented stories adapted from Madole et al. (1999) to communicate various changes to an object, animal, or person at a level accessible to
children. Race change stories presented a scenario that introduced a person of either white or black appearance. The person was described as looking and acting like “most black/white boys/girls” while growing up, after which a picture of the person was presented. Another picture, supposedly of the person’s natural parents or neighbors (depending on condition) was also presented. Next, a visit to the doctor was described, during which the doctor changed the appearance of the person to resemble the picture of the other ethnicity (black/white). A new picture, presumably of the same person after the doctor’s visit, was presented for the child. The child was then asked what he/she thought the person now was, “still a black/white person, or are they now a white/black person”? The response was recorded and follow up questions were asked regarding the race of this person’s potential offspring. A similar pattern was followed for the artifact changes and for the hair length changes, with minor changes to accommodate the differences in storyline. Examples of the stories and accompanying pictures can be seen in Appendix A.

Stories were accompanied by “before” and “after” photographs, as well as pairs of “parent” or “neighbor” photographs (depending on condition) that reflected the pre-transformation race, species, or artifact stimuli. Picture stimuli were obtained from several current on-line fashion magazines, animal-oriented websites, and from commercially available morphing software (e.g., Kai’s Super Goo). The photographs were manipulated using Adobe Photoshop 5.0. The pictures were then printed in black and white on glossy photo-quality paper with an ink-jet printer. The pictures were cut into 4 by 5 cards and laminated for durability. Examples of the stimuli can be seen in Appendix A.
**Design and Procedure**

Children were interviewed at their respective schools. Data was collected from each child in a single, 10–15 minute individual interview. Interviews were scheduled at the discretion of the children’s classroom teachers. Each child was told that his or her parents had given permission for the child to participate in what we were doing. They were told, in age-appropriate language, that they did not have to participate if they did not want to, and could quit at anytime without penalty. After the child indicated assent (orally for the youngest children, via signature for older children) the experimenter read a brief set of instructions telling the child that some of the questions “will seem unusual, but that [you] should answer as best that [you] can and that there is no right’ answer.”

Sessions were conducted in vacant classrooms or other available places within the schools, depending upon changing availability. Children were seated across a desk or table from the examiner. Each session was tape-recorded for later transcription. The examiner read seven short stories involving a change in appearance of an animal, an object, or a person. Four of the stories read to the children involved a change in the physical characteristics that specify an individual’s race, and three were control stories. The gender of the Stimulus person (Stimulus Gender) and direction of race change (Direction of change) were within subjects variables: each child received one set of stories and pictures demonstrating a black male changing in appearance to a white male, a white male changing in appearance to a black male, a black female changing in appearance to a white female and a white female changing in appearance to a black female.
One-half of the participants were randomly assigned to the Inheritance condition and the remaining half were assigned to the Noninheritance condition. In the Inheritance condition, the participants received race change stories that indicated inheritance by displaying a male and female pair of the same initial racial appearance as the Stimulus person. This pair was described as parents of the Stimulus person (Stimulus Parents). In the Noninheritance condition, participants received stories that displayed a male and female pair of the same initial racial appearance who were described as neighbors of the stimulus person (Stimulus Neighbors).

All participants received the same three control stories. One story described artifact changes (coffeepot to bird feeder) with the manipulation of "Inheritance" (made in same factory) for one half of the participants, and "Noninheritance" (made in different factories) for the other half. One story described animal changes (squirrel to rabbit), with inheritance split between the two conditions, and one described hairstyle changes (long hair to short hair), again with an inheritance split between conditions. Each story was accompanied by a "before" transformation and an "after" transformation picture as well as pictures of "parents" and "neighbors."

The stories were presented in two different, semi-random orders. The order was arranged so that no more than two race change stories were presented in sequence; the artifact, animal, and hair change stories were used to divide up the race change stories. The order was counterbalanced within age and child's gender.

Following each story, participants were asked to verbally indicate the stimulus' category membership (for example, is this person still a black person, or is he now a
white person?). Participants’ responses were marked on an answer sheet and were also recorded with an audio tape recorder. To further probe the inheritance aspect, follow-up questions were asked regarding the category membership of the stimulus’ offspring (e.g., “If ‘Sally’ had babies, what would her babies be? Would they be white babies or would they be black babies?”). The independent variable of the two different questions asked, whether the target stimulus changed, and whether the offspring have changed, will be henceforth referred to as Question. After all stories were read, children were probed for more information about what they believe makes someone the race that they are, why they can or cannot change, and why their children do or do not change.

Participants were debriefed at an age-appropriate level and any questions that they had were answered. As a precaution, children were assured in debriefing that this kind of change does not actually happen, even by mistake, and that the questions we asked were just to discover what children would think if it could have happened.
III. Results

The presentation of each story was followed by a question for which one of two answers was possible: change of category membership or no change of category membership. Each child was given a score of 1 for each response that indicated a change in category membership, and assigned a score of 0 for each response that indicated retention of category membership. Lower scores would indicate greater essentializing of the category.

The first analysis examined children's responses to the race change questions. I did not believe that Stimulus Gender would have a significant effect on the answers that the children gave. To assess whether Stimulus Gender had a significant impact on the children’s answers, scores were summed across direction of change resulting in a score from 0 (no change) to 2 (both stimuli changed). I then used a two-tailed, paired t-test to examine children’s responses when the stimulus was a woman versus when the stimulus was a man. Children showed no difference in responses to the stimulus change questions when the stimuli were female ($M = 1.57$) than when the stimuli were male ($M = 1.60$), $t(59) = .63$, $p = .53$. As well, there were no significant differences in responses to the offspring question when the stimulus was female ($M = 1.32$) than when the stimulus was male ($M = 1.38$), $t(59) = 1.07$, $p = .29$. Therefore, I collapsed across Stimulus Gender: female black to white race change and male black to white race change form a single response, and female white to black race change and male white to black race change form the second response. Therefore, each child’s scores could range from 0 to 2 for changes to the stimulus person, and 0 to 2 for changes to the offspring.
I also postulated that Order would not affect the answers that children gave. I used a two-tailed t-test to examine the effects of Order. Order 1 scores were marginally higher ($M = 3.5$) than Order 2 scores ($M = 2.79$), $t(59) = 1.88$, $p = .06$. Therefore, Order was included in the analyses.

A major hypothesis was a main effect of Age. I hypothesized that older children would have lower scores than would younger children, indicating that older children were less likely to accept a transformation than were younger children. A second hypothesis was an Age x Inheritance Condition interaction; I believed that the introduction of inheritance information would be more likely to lower older children’s scores than younger children’s scores. Third, I predicted a main effect of Direction of Change, with children being more likely to accept a race change in the direction of the majority (that is, from black to white). Lastly, an Age x Question x Inheritance interaction was hypothesized. I hypothesized that older children would be more likely to treat the racial category of a stimulus’ offspring as a natural kind when inheritance was emphasized than would younger children or children for whom inheritance was not emphasized. In order to evaluate these hypotheses, scores were entered into a 3 (age group) x 2 (inheritance condition) x 2 (direction of change) x 2 (question) x 2 (order) repeated measures ANOVA. Age group, inheritance condition, and order were between subject variables. Question and direction of change were repeated measures.

This analysis resulted in a main effect of Age, $F(2, 48) = 10.19$, $p < .01$. Preschool children ($M = 1.67$) were more likely to say that a stimulus changed racial category than were 4th grade children ($M = 1.03$), $F(1, 48) = 17.13$, $p < .01$. Likewise, 2nd grade children ($M = 1.64$) were more likely to say that a stimulus changed racial
category than were 4th graders, $F(1, 48) = 13.93, p < .01$. Preschool children did not differ significantly from 2nd grade children, $F(1, 48) = .023, p = .88$.

This analysis also revealed a main effect of Question, $F(1, 48) = 6.57, p < .05$. Change scores were higher for the target stimuli ($M = 1.58$) than for the offspring of the target stimuli ($M = 1.35$).

The ANOVA also revealed a main effect of Order, $F(1, 48) = 15.71, p < .01$. Children who received order 1 ($M = 1.71$) were more likely to report that a stimulus changed racial categories than children who received order 2 ($M = 1.19$). An Age x Order interaction was also found (table 1), $F(2, 48) = 3.73, p < .05$. Single degree of freedom contrasts revealed that preschoolers who received order 1 ($M = 1.75$) did not differ in their scores than did preschoolers who received order 2 ($M = 1.57$), $F(1, 48) = .008, p = .93$. Second graders who received order 1 ($M = 1.8$) did not differ significantly in their answers than did 2nd graders who received order 2 ($M = 1.44$), $F(1, 48) = .48, p = .49$. However, 4th graders who received order 1 ($M = 1.56$) obtained higher change scores than 4th graders who received order 2 ($M = .5$), $F(1, 48) = 18.37, p = .93$.

The Condition x Order interaction was also significant, $F(1, 48) = 6.75, p = .014$. 

![Figure 1. Age x Order Interaction](image-url)
Single degree of freedom contrasts revealed that children in the inheritance condition, order 1 ($M = 1.94$) had higher change scores than children in the inheritance condition, order 2 ($M = 1.1$), $F(1, 48) = 21.45, p < .05$. However, children in the noninheritance condition, order 1 ($M = 1.45$) did not differ from the children in the noninheritance condition, order 2 ($M = 1.27$), $F(1, 48) = .936, p = .34$.

Finally, there was a Question x Direction x Inheritance Condition interaction, $F(1, 48) = 4.2, p < .05$. To simplify this analysis I ran a separate analysis for each Question type; one analysis for the target stimuli, and one analysis for the offspring of the target stimuli. Analysis of the target stimuli scores did not reveal effects of condition or direction, but did reveal a marginal Direction x Condition interaction, $F(1, 58) = 3.73, p = .06$. Children’s response scores for the target stimuli in the white to black, inheritance condition ($M = 1.67$) were higher than for the black to white, inheritance condition ($M = 1.6$). Children’s response scores for the white to black, noninheritance condition ($M = 1.47$) were lower than for the black to white, noninheritance condition ($M = 1.6$), although none of these differences were significant. For the offspring question, there was a trend toward a Condition effect, $F(1, 58) = 2.80, p < .10$. Children in the inheritance condition ($M = 1.52$) had higher scores than children in the noninheritance condition ($M = 1.18$). This trend was in the opposite direction from what was expected. The analysis of the offspring question also revealed an effect of direction of change, $F(1, 58) = 4.49, p = .05$. As hypothesized, children had lower scores when the race change was from black to white ($M = 1.25$) than when the race change was from white to black ($M = 1.45$). There was not a Condition x Direction interaction for the offspring question.

I predicted an overall Direction main effect, hypothesizing that children would be
more likely to accept a change in the direction of the majority (that is, black to white). While there is not a significant main effect of the direction of change, there is a trend in the direction expected, $F(1, 48) = 3.36, p = .07$. Racial change from black to white ($M = 1.53$) resulted in marginally higher change scores than from white to black ($M = 1.41$).

I predicted that there would be an Age x Inheritance Condition interaction but analysis disconfirmed my hypothesis, $F(1, 48) = .58, p = .56$. As well, I predicted an Age x Inheritance Condition x Question interaction that was also disconfirmed, $F(2, 48) = .15, p = .86$.

The goal of the next set of analyses was to determine whether, overall, children viewed race more like a biological entity or like an artifact. To examine whether children viewed race more like a biological entity or like an artifact required the comparison of race stories with animal and artifact stories. I used chi square analyses to examine these categorical responses. As predicted, there was an increasing tendency to essentialize race as children’s age increased. The initial analysis examined children’s responses to see if the children treated changes to animals different than they treated changes to artifacts. Preschool students treated animals and artifacts similarly, $\chi^2(1) = .36, p = .55$. Preschoolers, overwhelmingly responded that both animals and artifacts can change category membership. In other words, preschoolers failed to essentialize either category. Second grade students treated animals and artifacts as marginally different, with responses that indicated resistance to the idea that animals could change categories as easily as artifacts, $\chi^2(1) = 3.27, p = .07$. Fourth graders treated animals as significantly different from artifacts, $\chi^2(1) = 5.81, p < .05$. Fourth grade responses clearly indicate that they are beginning to
essentialize animals as natural kinds, and therefore resist animal changes more than changes to artifacts (see Table 2).

The second chi square analysis examined children’s responses to see if they treated changes to race different than how they treated changes to animals. Preschool children, $\chi^2(1) = .03$, $p = .87$, 2nd graders, $\chi^2(1) = .02$, $p = .89$, and 4th graders, $\chi^2(1) = .77$, $p = .38$ all treated racial categories as similar to animal categories.

Lastly, a chi square analysis was used to examine how children treated race compared to how children treated artifacts. Preschool children treated race in the same way that they treated artifacts -- that is, that both were equally likely to change, $\chi^2(1) = .68$, $p = .41$. Second grade children essentialize race more than they do artifacts, $\chi^2(1) = 3.8$, $p = .05$, as do 4th grade children, $\chi^2(1) = 10.16$, $p < .01$.

Table 2. Percentage of Children Essentializing (denying changes to category membership)

<table>
<thead>
<tr>
<th>Age</th>
<th>Artifacts</th>
<th>Animals</th>
<th>Race</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preschool</td>
<td>4.17%</td>
<td>8.33%</td>
<td>9.38%</td>
</tr>
<tr>
<td>2nd Grade</td>
<td>0.00%</td>
<td>16.67%</td>
<td>18.06%</td>
</tr>
<tr>
<td>4th Grade</td>
<td>0.00%</td>
<td>27.78%</td>
<td>38.89%</td>
</tr>
</tbody>
</table>
IV. Discussion

The results of this study provide some evidence in support of my predictions, but they also revealed some unanticipated effects. I hypothesized that there would be a significant main effect of the age of the child. I expected that older children would have lower change scores than would younger children. This hypothesis was confirmed. Older children had significantly lower scores than did younger children, indicating that older children were more resistant to the idea that a person could change racial categories than were younger children. Fourth grade students were significantly more likely to deny that a person could change racial categories due to changes made by a doctor than were 2nd graders or preschool children. Preschool children and 2nd grade students did not differ in their responses. There appears to be a shift in thinking somewhere between 2nd grade and 4th grade that changes how children think about racial categorization with increasing essentializing of race. What is it that changes?

I hypothesized that inheritance was the domain-specific piece of knowledge that children needed to develop an adult-like theory of race -- that is, to treat race as a natural kind. I believed that if children received information describing race as a social concept (that is, the noninheritance condition) that they would be less likely to hold views of race constancy than would children who were presented with inheritance information (the inheritance condition). This prediction would have been confirmed by a significant main effect of inheritance condition. I also expected that
older children’s responses would be influenced more by inheritance information than would younger children’s scores; therefore, I also predicted an Age x Inheritance Condition interaction. Finally, I thought it was possible that children may accept transformations to the stimuli but deny transformations to the offspring of the stimuli. The photographic evidence of race changes might have influenced a child’s decision about the stimulus person’s racial change despite the child’s knowledge of inheritance -- that is, children’s knowledge of inheritance may have been overridden by the visual evidence of the transformation to the stimulus person. However, the latent knowledge of inheritance may have resurfaced when children were then asked about the offspring of the stimulus person. The visual evidence of the transformation may have trumped children’s knowledge of inheritance for that specific stimulus person, but without visual evidence of the offspring, the knowledge of inheritance could have caused children to predict that the offspring would remain the pre-transformation race. In other words, while the children may accept transformations to the stimulus because of the visual evidence, they may still reject transformations to the stimulus’ children because of inheritance. Therefore, I predicted an Age x Inheritance Condition x Question interaction. However, contrary to my predictions, the introduction of inheritance did not have a significant impact on the responses that the children gave overall, nor did the predicted interactions emerge. Older children resisted changes to race more than did younger children, but inheritance did not appear to have any effect on their responses.

There are several possibilities about why inheritance did not affect children’s answers in this study. The first is that the children did not understand inheritance as it might affect changes to a person’s race. A second possibility is that inheritance is not
relevant to children's treatment of racial categories and that the hypotheses I made were simply incorrect. Perhaps knowledge of inheritance is unimportant to children. However, contrary to both of these possibilities is Springer's (Springer & Keil, 1989; Springer, 1992) evidence that children do, in fact, have a knowledge of inheritance and that children place a higher priority on biological kinship than social relationship when that information is presented. This finding would suggest that children both understand the basic concept of inheritance and are influenced by inheritance information when it is presented. Springer's research was foundational to my hypothesis that children would respond differently to race when it was a social relationship than they would when it was a kinship, and that the understanding of inheritance would be key for a child beginning to essentialize race. Thus, an alternate explanation is that the operationalization of inheritance information in this study simply did not trigger children's knowledge of inheritance. The explanations of the "parent" pictures were brief, and merely describing the people in the picture as "parents" may have been insufficient to trigger the concept of inheritance, or the mention of kinship or social information was unnoticed by the child. Perhaps the novelty of the storyline presented and the possibility of a person changing their skin color may have been so fascinating to children that it occupied their full attention and the subtlety of the inheritance information was lost. As well, unlike Springer (1992), I did not present the same children with both conditions of social relationship and conditions of kinship. The presentation of both types of relationships sets the two in contrast to each other and may force the child to make a choice about which to emphasize. In this study, however, children were presented with only one condition
or the other and the forced prioritizing of the inheritance versus noninheritance information did not take place. Follow up studies could look at inheritance condition as a repeated measure rather than as a between subjects variable. Information could then be obtained about how individual children treat race when it is presented as a social concept versus when it is presented as a kinship concept. Perhaps when children are presented with both scenarios it will cause them to think differently about how the racial identities and the relationships of the parents or the neighbors may affect the possibility of the stimulus changing. As mentioned previously, it could also have been that visual evidence of the transformations overpowered children’s knowledge of inheritance, presenting a more compelling reason to accept transformations. Future studies could examine the same issues without using pictures as evidence to provide a more accurate measure of how the knowledge of inheritance factors into children’s decisions by removing evidence that could override their knowledge and cause their responses to change. Another important consideration for future research is the presence or absence of inheritance knowledge. In this study, I did not actually examine each child’s level of understanding for inheritance. Future research could screen to check children’s understanding or lack of understanding of inheritance and compare children’s responses directly to their level of inheritance knowledge.

Order turned out to be a main effect that was not predicted. Similarly, Age x Order and Inheritance Condition x Order interactions were not expected. Examination of the orders that were used present few obvious clues as to why order should matter (see Appendix C). One possibility is related to the fact that the animal
change story was presented first in Order 1, but the artifact change story was
presented first in Order 2. For the 4th grade students, having the object stimuli first
(order 2) may have cued them about what kinds of answers were expected. They
knew that a coffeepot could easily become a birdfeeder, but were sophisticated
enough to realize that changes to people were not quite as simple as changes to
objects and put more thought into their answers. This cueing may help to explain the
Age x Order effects. The younger students were not yet sophisticated enough to
understand the object transformations as different than transformations to people, but
the older students did. The possibility of a cueing effect for older children could be
explored more fully by specifically manipulating where object transformations are
placed in the order of stimuli to see if the object transformations affected responses
after their introduction. In this study, object transformations were either at the very
beginning or at the very end of the orders, so no further exploration of this possibility
is available. In my opinion it is more likely that, because of the small sample size (9
for each order in each age group), the 4th grade, order 2 group randomly happened to
have two or three precocious students who had already fully developed an adult-like
theory of race. Thus, the inadvertent grouping of these students in the same order
variable created the effects revealed in the analysis. In future research, larger sample
sizes could minimize this effect.

Another hypothesis that needs to be considered is Direction of Change (whether
the stimulus was changing from black to white or white to black). I hypothesized that
children would be more likely to accept racial change in the direction of the majority.
There was a trend revealed in the direction expected. Children were more likely to
accept racial change from black to white than from white to black. The likely
explanation for this effect is in-group bias. Nearly all of the children in the study were Caucasian; therefore, in-group bias would suggest that children would be more likely to accept changes in the direction of the race that they themselves are. Children may assume that because they like the race they themselves are then everyone else probably wants to be the same race, too.

I believed it would be likely that children would remain consistent in their answers to the type of question asked (whether it is the target or the offspring). Contrary to my prediction, however, the analysis revealed a main effect of question type. Children had higher scores for the target stimuli than for the offspring, indicating that they were more likely to accept changes to the target than to the offspring and presenting the possibility of a latent understanding of inheritance. The children may have understood the implications of racial constancy and the process of inheritance, but their responses were swayed by the salience of the pictorial evidence of the changes. The evidence that a target person looked one way, went to the doctor, and now looks like a different race could have been compelling enough to bypass the inchoate theories of inheritance and racial constancy. This latent knowledge of inheritance could have been swayed by the pictorial evidence of the target changing appearance, but could have resurfaced when the offspring’s racial categorization was queried. Put more simply, the children could have been willing to accept a superficial change in appearance as a de facto change of racial category for a given person. However, because of the awareness of the implication of inheritance, the original racial characteristics may have been viewed as being transmitted to the stimulus person’s offspring despite apparent changes to the stimulus person’s racial category. Appendix D contains selected transcriptions that present children’s explanations of
why they believe that the offspring did not change racial categories even though the
target stimulus did. Some children were very clear and consistent in their
understanding and explanation of this concept (see Appendix D, Participant 29).
Other children had a vague understanding that was not consistently applied (see
Appendix D, Participant 32).

So, in light of the findings presented here, how do children view race? Do young
children possess a conceptual, adult-like theory of race? Do very young children
essentialize race as Hirschfeld (1995) suggests? Or is an adult-like theory of race a
gradual development as others suggest (Aboud, 1987; Aboud, 1988; Semaj, 1980)?
The chi square analyses show clearly that preschool children treated race in the same
way that they treated animals and artifacts. Preschool children accepted a change in
racial category as easily as they accepted a coffeepot turning into a birdfeeder. Thus,
it does not appear that young children are essentializing race with the adult-like
understanding that Hirschfeld believes that they have. Second grade students did not
treat animals any differently than they treated artifact changes, but they did appear to
be essentializing race to some extent and treated race as different from artifacts.
Fourth graders essentialized both animals and race, but did not essentialize artifacts.
Fourth graders did not essentialize race with the near unanimity that adults do
(Madole et al., 1999), but more fourth graders essentialized race than did 2nd graders,
and more 2nd graders essentialized race than did preschool children. Children showed
a clear developmental trend toward essentialization of race, from no essentializing at
a young age, to some essentialization in elementary school, to nearly unanimous
essentializing of race in adulthood.

It appears, then, that children are following a development trend toward
essentializing that begins sometime after preschool and matures fully sometime after 4th grade. What is this transformation that is occurring? Is there a sudden, qualitative change in how children categorize as some believe (Hirschfeld, 1994, 1995; Keil, 1989; Mandler, 1993), or, as others maintain, is there a gradual, quantitative change in children’s knowledge that leads to this shift in thinking (Madole & Oakes, 1999)?

I believe that there is a gradual, quantitative change in the information that a child possesses. Some of the children in the 2nd and 4th grade age groups possess pieces of information that change how they think about racial transformations. Some of these children have not yet encountered the information they need or, if they possess it, have not yet learned to apply it to this kind of situation. This information may or may not be knowledge of inheritance; more exploration needs to be done. It makes sense, however, that as information becomes available children learn to apply it to various situations, including racial categorization. Some children may, either through happenstance or differences in environment, acquire knowledge at different points in development, and changes to view of racial categorization follow.

So, to summarize, the evidence presented here showed that older children essentialized race more than did younger children, though not with the unanimity that Madole et al. (1999) found with adults. There was a developmental progression in children’s essentializing of race, from virtually no essentializing in preschool, to approximately one third of 4th grade students essentializing race. Inheritance did not play a significant role in children’s treatment of race. It is unclear from this study whether inheritance is not a piece of knowledge that factors into children’s development of an adult-like theory of race, or if I simply did not manipulate inheritance in the right manner. Follow up studies need to be done to clarify the role,
or lack of role, that inheritance plays in children’s understanding of race.
References


Appendix A

Stories and Stimulus Pictures
When this animal was born, it did things that rabbits usually do. Here are pictures of this animal’s mommy and daddy. Here is a picture of the animal when it grew up. One day the animal got sick, so the vet gave it some medicine. But the medicine was too strong, and the little animal lost its long ears. It grew a bushy tail and behaved like a squirrel. The animal could not be changed to be the way it was before. Here is a picture of what the animal now. What is this animal? Is this animal still a rabbit, or is it now a squirrel? If this animal had babies, what would its babies be?

When Sally was little, she did the things that young white girls usually do and looked like most white people. Here are some pictures of Sally’s mommy and daddy. Here is a picture of Sally when she grew up. One day Sally went to the doctor, who changed the way Sally looks. Her skin was made to be darker and her face and hair were changed. None of what the doctor did could be changed back again. Here is a picture of Sally now. What is Sally? Is Sally still a white person, or is she now a black person? If Sally had babies, what would they be?

When Bruce was little, he did the things that young white boys usually do and looked like most white people. Here are some pictures of Bruce’s mommy and daddy. Here is a picture of Bruce when he grew up. One day Bruce went to the doctor, who
changed the way Bruce looks. His skin was made to be darker and his face and hair were changed. None of what the doctor did could be changed back again. Here is a picture of Bruce now. What is Bruce? Is Bruce still a white person, or is he now a black person? If Bruce had children, what would his children be?

When Bob was little, he did things that people with long hair do. He brushed his hair and pulled it back in a ponytail. Here are pictures of Bob’s mommy and daddy. Here is a picture of Bob when he grew up. One day Bob went to the barbershop to have his hair cut, and the barber cut off almost all of Bob’s hair and made it so it could never grow long again. Here is a picture of Bob now. What is Bob, a long haired person or a short haired person? If Bob had children, what would his children be?

When Sharon was little, she did the things that young black girls usually do and looked like most black people. Here are some pictures of Sharon’s mommy and daddy. Here is picture of Bob when he grew up. One day Sharon went to the doctor, who changed the way Sharon looks. Her skin was made to be lighter and her face and
hair were changed. None of what the doctor did could be changed back again. Here is picture of Sharon now. What is Sharon? Is Sharon still a black person, or is she now a white person? If Sharon had babies, what would her babies be?

![Sharon's pictures]

When Billy was little, he did the things that young black boys usually do and looked like most black people. Here are some pictures of Billy’s mommy and daddy. Here is a picture of Billy when he grew up. One day Billy went to the doctor, who changed the way Billy looks. His skin was made to be lighter and his face and hair were changed. None of what the doctor did could be changed back again. Here is a picture of Billy now. What is Billy? Is Billy still a black person, or is he now a white person? If Billy had babies, what would his babies be?

![Billy's pictures]

When this thing was made, it was used to pour out coffee. Here are some other things made in the same factory. This is a picture of this thing when it was made. Then
some people took it. They took some pieces off of it, made some other changes, and filled it with seeds. None of what they did to it could be changed back again. After they did all of this, they used it to feed birds. Here is a picture of this thing now. What is this thing? Is it still a coffeepot, or is it now a birdfeeder?
Appendix B

Informed Consent and Child Assent Documents
INFORMED CONSENT FORM

Dear Parent/Guardian:

Your child is invited to participate in a study of children’s understanding of how animals, objects, and people can change. The aim of our study is to better understand how children think about people, and especially about race. This study is being conducted by Dr. Kelly Madole and Jason Glerum of Western Kentucky University in cooperation with your child’s school. The project will be conducted in one short session at your child’s school, in cooperation with your child’s teacher. We will coordinate the session with your child’s teacher so that your child does not miss any important learning activities.

The session will take about 15 minutes; your child will be interviewed individually. If you agree to allow your child to take part in this research, your child will be read eight brief stories describing animals, objects, or people undergoing some changes. The changes to people involve a change in the individual’s race (from black to white or from white to black). After being read each story, your child will be asked to decide whether the object, animal or person has really changed. Responses may be tape recorded to ensure that all information is collected accurately. The tape recordings will be accessible only to the researchers and will be destroyed after the information is transcribed.

We emphasize that your child’s participation is entirely voluntary. If you or your child decides not to participate, it will have no negative outcome for you or your child in any way. Your child may refuse to answer any question and may withdraw from the study at any time. Individual participants’ responses will be kept anonymous. The results may be part of a published research project in which all results would be reported in terms of group averages, and no children will ever be identified by name. If you wish, group information will be available in a written report of the results.

The procedures in this study have been reviewed and approved by the Western Kentucky University Committee for the Protection for Human Research Participants. The University has filed a form called “Assurance of Compliance with DHHD regulations for the Protection of Human Subjects” with the Department of Health and Human Services.
Specific questions about this study may be directed to Dr. Kelly Madole, Research Director for this project at (270) 745-6475. We urge you to phone if you have any questions. We will be happy to hear from you.

We hope that you will allow your child to take part in our study. We promise to make it a pleasant experience and to schedule our sessions in cooperation with your child’s teacher. Please fill in your child’s name, your child’s, date of birth, and teacher’s name below. To indicate your consent, sign your name, and fill in the date below. When your child returns this letter to the teacher, whether you say yes or no, your child will receive a Western Kentucky University “Big Red” pencil.

Thank you for your help.

Sincerely,

Kelly Madole, Ph.D.
Associate Professor

Jason Glerum
Graduate Student

________________________________________________________________________

Western Kentucky University

Parental Consent Form

Child’s name:________________________________________ Date of Birth:__________

Teacher’s name:_____________________________________

________ No. I do not give my consent for my child to participate in this study.

________ Yes. I have read the information provided about this study, and give my consent for my child to participate in the individual interview that is part of the study conducted by Dr. Kelly Madole and Jason Glerum of Western Kentucky University. I understand that although my child may be tape recorded, anonymity and security of data will be maintained. I also understand that I may withdraw my child from the study at any time without penalty.

Parent/Guardian
signature:________________________________________ Date:____________
CHILD/MINOR ASSENT FORM

I, ___________________________ understand that my parents (mom and dad) have said it's okay for me to take part in a project about how things can change under the direction of Kelly Madole and Jason Glerum.

I am taking part because I want to. I know that I will be tape recorded but that only the people working with Kelly and Jason will be able to hear the tape. I have been told that I can stop any time I want to and nothing will happen to me if I want to stop.

______________________________
Signature
Appendix C

Orders for Stimulus Presentation
<table>
<thead>
<tr>
<th>Order One</th>
<th>Order Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal transformation</td>
<td>Artifact transformation</td>
</tr>
<tr>
<td>White to Black Female transformation</td>
<td>Male Black to White transformation</td>
</tr>
<tr>
<td>White to Black Male transformation</td>
<td>Female Black to White transformation</td>
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<tr>
<td>Long Hair to Short Hair transformation</td>
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<td>Black to White Female transformation</td>
<td>Male White to Black transformation</td>
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<tr>
<td>Black to White Male transformation</td>
<td>Female White to Black transformation</td>
</tr>
<tr>
<td>Coffeepot to Birdfeeder transformation</td>
<td>Animal transformation</td>
</tr>
</tbody>
</table>
Appendix D

Selected Transcriptions
1. Participant 29: Male 8y/o Caucasian: Inheritance, Order 2, Set 2

Examiner: *Female black to white race change story* (...is she still a black person?)
Child: Uhn-uh. *Shaking head*
Examiner: She’s now a white person?
Child: Mm-hmm. *Nodding.*
Examiner: Okay, what would her babies be if she had babies?
Child: White.
Examiner: White? Why do you think they would be white?
Child: Well, I think they’d be black, really, because it’s not changing everything in your body. It’s not changing every kind of part in your body. Because whatever makes the baby, it’s probably gonna ... probably, probably born to be black but you got your skin changed so it would still probably be black, because that’s just you that’d be white.
Examiner: Okay. So, you think that she would be white, but the babies would be black?
Child: *nod*
Examiner: Yeah? Why do you think that she would be whi...
Child: Sort of tan.
Examiner: Sort of tan? Why do you think that Sally would be white?
Child: Because she got her, umm.., her skin changed.
Examiner: Okay, but that doesn’t mean that her babies’ skin would be changed?
Child: *Shaking head.*
Examiner: No? Okay.
Child: Cuz you didn’t change the babies.
...
Examiner: *Male white to black race change story.*
Child: A black person.
Examiner: What would his babies be?
Child: White...?
Examiner: Why do you think they’d be white?
Child: *long pause*
Examiner: Same reason as before?
Child: Yeah.
Examiner: Which was what?
Child: Cuz they didn’t change, you know, the parts his body and stuff and then like, whatever makes the babies, it would probably like, it ain’t changing that, it’s just changing him.
Examiner: Okay, so there are parts of your body other than your skin that makes you black or white?
Child: *nod.* Mm-hmm.

2. Participant 32: Female 7y/o African-American: Inheritance, Order 1, Set 2
Examiner: *Female white to black race change story*
Child: Um, a black person.
Examiner: If she had babies, what would her babies be?
Child: Uh...white.
Examiner: They’d be white?
Child: *nod*
Examiner: Why do you think her babies would be white?
Child: Because that’s her body.
Examiner: What do you mean by that?
Child: Like…under the skin that the doctor did, it’s really white.
Examiner: So the doctor just changed the skin…
Child: Uh-huh.
Examiner: …but underneath the skin there is still something else?
Child: *nod*
Examiner: Okay. What else is it, do you think? What is it that didn’t change?
Child: Her heart, and other parts of her body.

*Female black to white race change story.*

Examiner: Uh, white.
Examiner: If she had babies, what would her babies be? Black babies, or white babies?
Child: Uhh…probably white.
Examiner: Why do you think they would be white?
Child: Because she’s a white person now, and she’s…gonna have white babies.