

The Development of Cognitive Abilities and Social Identities in Children: The Case of Ethnic Identity

Katheryn A. Ocampo

Hamilton Center, Brazil, Indiana, USA

George P. Knight and Martha E. Bernal

Arizona State University, Tempe, AZ, USA

The literature on the development of social identities in children has largely adhered to a cognitive developmental framework. However, to date, there has been little or no direct empirical demonstration of cognitive developmental levels associated with age accounting for variations in the expression of social identities. The current study directly assessed this hypothesis within ethnic identity. Ethnic identity in school-age children was assessed with the components outlined by Bernal, Knight, Garza, Ocampo, and Cota (1990), whereas level of cognitive ability was measured with an adaptation of Piaget's conservation and classification tasks. It was hypothesised that cognitive ability would account for age differences in the components of ethnic self-identification, ethnic constancy, and to a lesser extent, ethnic knowledge. The results demonstrated that level of cognitive ability did not account for the age differences in ethnic self-identification or ethnic constancy. However, they did account for differences in ethnic knowledge. It is possible that the age changes found in ethnic and other social identities may be caused by other age-related changes in development, such as changes in learning through socialisation. This would imply that other phenomena hypothesised to be caused by changes in cognitive ability, such as the development of in-group pride and prejudice in children, may be altered by changes in the way young children are socialised by

Requests for reprints should be sent to Katheryn Ocampo, Hamilton Center, McRoy Building, 1210 E. National Avenue, Brazil, Indiana 47834, USA.

We extend our appreciation to Marya Cota and Camille Garza for their effort in helping to conduct this study; to Sue Somerville and Laurie Chassin for their ideas and feedback on an earlier version of this paper; to Richard Castillo, Mary Ciulei, Jessie Garcia, Ilse Schroeder, Mike Smith, Debbie Valenzuela, and Cristina Velastegui for their assistance in data collection and coding. We are grateful for the co-operation of Dr John Bartell, Deborah M. Hull, Dr Thomas Butler, Manuel Madrid, and the staff, children, and parents of Kuban, Sullivan, and Wilson Elementary Schools of Phoenix, Arizona. This research was completed by the first author, under the direction of the second and third authors, in partial fulfilment of the requirements of the Masters of Arts degree, Department of Psychology, Arizona State University.

familial and nonfamilial agents. Research on social identities may benefit from a departure from cognitive developmental theory and from increased attention to other theories, such as socialisation theory, in understanding the development of ethnic identity and other social identities.

A cognitive developmental approach has often guided researchers investigating the formation of social identities such as gender, ethnic, and racial identity (Aboud, 1984, 1988; Aboud & Doyle, 1993; Bernal, Knight, Garza, Ocampo, & Cota, 1990; Emmerich, Goldman, Kirsch, & Sharabany, 1977; Semaj, 1980; Slaby & Frey, 1975). These investigators have reported changes in the expression of social identities in relation to age differences in children, and suggested that cognitive developmental levels associated with age account for these variations in expression. However, to date, there has been very little in the way of direct empirical demonstration of this relationship between level of cognitive ability and social identities. That is, although there is evidence that cognitive abilities and social identities change with age, there is no direct evidence that these two sets of developmental achievements are associated. The goal of this study was to examine the relation between the age differences in cognitive ability to the age differences in an ethnic social identity within a sample of children aged 4–10 years.

Social identities, such as ethnic identity and gender identity, have been conceptualised by some researchers (Aboud, 1987, 1988; Bernal et al., 1990; Rotheram & Phinney, 1987; Slaby & Frey, 1975) as multidimensional. For example, Slaby and Frey (1975) have described gender identity as composed of gender self-identification and gender constancy. Similarly, Bernal et al. (1990) have described ethnic identity as composed of ethnic self-identification, ethnic constancy, ethnic knowledge, and ethnic preferences and feelings. Several investigators (Aboud, 1987, 1988; Bernal et al., 1990; Kohlberg, 1966) have suggested that the self-identification and constancy components of gender identity and ethnic identity are largely influenced by cognitive development.

Changes in social identities with age have been well documented in the literature on the development of gender (Brenes, Eisenberg, & Helmstadter, 1985; Carter & Levy, 1988; Coker, 1984; Slaby & Frey, 1975), racial (Clark, Hocevar, & Dembo, 1980; Levine & Ruiz, 1978; Semaj, 1980), and ethnic identities (Aboud, 1977, 1980, 1984; Bernal et al., 1990). Ethnic, racial, and gender self-identification (the ability to ascribe a group label to oneself) have been found to develop before ethnic, racial, and gender constancy (knowledge that one's group membership is permanent and unchanging despite transformations across time, appearance, or settings) (Aboud, 1988). Within the area of ethnic identity, Bernal, Knight, Organista, Garza, and Maez (1993) demonstrated that Mexican American children

younger than five years of age had either minimal or no understanding of ethnic identity. In a later study, Bernal et al. (1990) demonstrated that older Mexican American children (6- to 10-year-olds) had greater understanding of their ethnic identity, as evidenced by a greater number of correct ethnic labels, fewer errors in identifying and sorting children of their own ethnic group, more accurate sorting of themselves into the correct ethnic group, and more complex reasons for sorting themselves into this group as they grew older. They also found that older children had a greater sense of ethnic constancy, knew that certain behaviours were characteristically Mexican, and preferred more Mexican traditions and behaviours than did younger children. In addition, Aboud (1977, 1980, 1984, 1988) has demonstrated that between the ages of 4 and 8 years children become more capable of perceiving similarity between themselves and their own group. The older children in her sample were better able to categorise various groups based on perceptual cues and to label groups appropriately, and had a better sense of ethnic constancy.

Aboud has also discussed ways in which the development of ethnic identity affects children's ideas of pride in their group (Aboud & Doyle, 1993) and ideas about prejudice against others (Aboud, 1988). She outlined a social-cognitive developmental theory of prejudice, whereby changes in cognitive structure would result in nongradual changes in children's levels of prejudice. In this theory, Aboud discussed a critical change in feelings of prejudice as children begin to understand categories, achieve ethnic constancy, and are able to decentre (attend simultaneously to two or more perspectives) as a result of a change from the preoperational to concrete operational stage (Aboud, 1988). Aboud cited as evidence, data demonstrating reduced reports of prejudice in children at around age 7, when the shift from pre-operational to concrete operational thought is believed to occur. In addition, Aboud and Doyle (1993) outlined a cognitive developmental explanation for the development of in-group identification and pride, which predicts changes in feelings of pride towards one's ethnic group as a result of the development of ethnic identification and ethnic constancy due to cognitive development.

Chronological age has often been used as a marker for developmental level and ensuing cognitive changes. The age differences in ethnic identity reported by Aboud (1984, 1988) and Bernal et al. (1990) were interpreted to be the result of changes in cognitive development, which is believed to include an increased ability to classify, conserve, and to use more complex cognitive processes. These assumptions are based in part on Kohlberg's (1966) hypothesis that an understanding of constancy reflects underlying structural change that develops with concrete operational thought. If the mastery of ethnic self-identification and constancy is reflective of underlying structural change, then these components of ethnic identity should be

related to measures of physical conservation and classification. In addition, cognitive ability level, as determined through cognitive tasks, should explain the age differences found in ethnic identity.

Two studies (De Lisi & Gallagher, 1991; Marcus & Overton, 1978) examined changes in cognitive ability (measured by physical conservation) and associated differences in gender constancy through partial correlation analyses and covariance analyses. However, these researchers did not conduct the necessary statistical tests of mediation. Neither investigation isolated the effect of cognitive ability in their analyses and examined the role of cognitive ability in accounting for the variance found in gender constancy. That is, the authors did not demonstrate that variance in cognitive ability accounted for the age differences in gender constancy.

In other studies of physical conservation and constancy (Aboud, 1984; Clark et al., 1980; Semaj, 1980), the investigators simply found age differences in social constancy, age differences in cognitive ability, and correlations between social constancy and cognitive ability. They then assumed that the age differences found within social constancy were due to differing levels of cognitive ability because of the correlation between the two, and interpreted such relations as causal rather than spurious. However, it is possible that age differences in ethnic, racial, and gender constancy are not the result of age differences in cognitive ability. For example, height and mathematical ability are variables that demonstrate age differences that are occurring during the same age range. However, such age differences may be due to two separate processes: physical maturation and learning. Yet, if one were to notice age differences in both (where both values go up with age), then one may erroneously assume that the increased scores of height and mathematical ability with age were due to the same underlying process. Therefore, the significant correlations found in the literature between constancy and level of cognitive ability may simply reflect spurious covariation because both are related to age.

The present investigation was designed specifically to determine if the age differences in cognitive abilities and the age differences in ethnic identity represent shared variance. That is, a mediational test was conducted to investigate if the variance in cognitive ability accounted for the age differences in ethnic identity. In this study, measures of the five components of ethnic identity outlined by Bernal et al. (1990) and performance on two cognitive tasks were obtained. Relationships between ethnic identity, cognitive ability, and age were examined to determine if the age differences found in children's ethnic identity scores were due to differing levels of cognitive ability. This finding would support the hypothesis that children's level of cognitive ability determines the expression of ethnic identity.

Because ethnic self-identification and constancy are theoretically and empirically related to both cognitive ability and age (Aboud, 1984; Bernal et

al., 1990; Kohlberg, 1966; Semaj, 1980), it was expected that mediation would be detected in these components of ethnic identity. The component of ethnic knowledge was also investigated in the mediational analyses based on the prediction that ethnic knowledge increases with age, as does gender knowledge, partially as a function of cognitive development (Bernal et al., 1990; Eisenberg, 1983).

METHOD

Subjects

The children who participated in this study were drawn from a larger data set of Mexican American children and their mothers ($N = 126$). The sample reported on here consists of 103 Mexican American children (48 boys and 55 girls). The mean age of the children was 7 years 6 months, with a range of 4 years 8 months to 10 years 5 months. Children were selected for the current study based on age and data obtained on 23 older children in the sample (ages 10–12) were not used in the current study. Although information was collected from children's mothers, the information was not used for the current investigation and will not be described in this report. Demographic characteristics of the sample are presented in Table 1.

Only children whose parents were both of Mexican descent were included in the study. Mexican ethnicity was determined by parent report. First generation children were born in Mexico with either one or both parents also born in Mexico. Second generation children were born in the United States with either one or both parents born in Mexico, and third generation children were born in the United States and had parents who were also born in the United States. The participants were drawn from three elementary schools in Phoenix, Arizona where the ethnic composition was approximately 75% Hispanic, and 25% combined Anglo, Black, and Native American. The socioeconomic status of the three schools was low, with most students qualifying for free lunches.

Participants' families were contacted by letters (in both English and Spanish) that were sent home with the children. Parents of approximately 25% of the children with Spanish surnames returned a form indicating interest in the study. Of that 25%, approximately 5% were deemed ineligible, largely due to mixed ethnicity. Parents received small incentive payments for their participation and signed informed consent forms.

In order to be involved in the study, children had to be classified as Fully English Proficient on the Language Assessment Scale (LAS; DeAvila & Duncan, 1990). A small percentage of children had not taken the LAS and were identified as English-proficient by their teacher. English-speaking proficiency was important because of the heavy influence of language on performance within the cognitive tasks.

TABLE 1
Demographic Information for the Sample

<i>Grade^a</i>	<i>N (% of sample)</i>
Head start	9(9%)
Kindergarten	22(21%)
First	26(25%)
Second	13(13%)
Third	18(18%)
Fourth	14(13%)
<i>Children's generational status</i>	
1st generation	16(15.5%)
2nd generation	53(51.5%)
3rd generation and above	34(33%)
<i>Mother's education level</i>	
Less than elementary school	43(41.7%)
Some high school or hs graduate	47(45.6%)
Some college or college graduate	13(12.6%)
<i>Father's education level^b</i>	
Less than elementary school	41(39.8%)
Some high school or hs graduate	34(33%)
Some college or college graduate	13(12.6%)

^a One child had not yet begun attending school. ^b No information was available for 15 (14.6%) of the fathers due to single parent households.

Procedures and Measures

The children were individually interviewed in two separate 30-minute sessions by trained Hispanic female graduate or undergraduate students. The Ethnic Identity Questionnaire was administered during one session and the Classification and Conservation Tasks were administered in a second session. The children's responses to the classification and conservation tasks, but not the ethnic identity scales, were audiorecorded.

Children's Ethnic Identity. The components of children's ethnic identity were measured using a questionnaire adapted from Bernal et al. (1990). The components of Ethnic Role Behaviors and Ethnic Preferences were not used in the present study and thus, will not be described here.

Ethnic Self-identification. This component was measured with an Ethnic Grouping task. The tasks were presented as follows: (a) Ethnic Grouping of Others—the children were given pictures of six unknown Mexican American children and six unknown Anglo-American children. The pictures selected for use were of children whose ethnicity could be reliably predicted by several adults. The children were asked to put the photographs of all the Mexican children in one box and the other children (who were not

Mexican) in the other box. (b) *Ethnic Self-grouping*—the children were shown a Polaroid photograph of themselves and asked to put it in the box in which it belonged. (c) *Reason for Self-grouping*—the children were then asked in what way they were similar to the children in the selected box. The level of abstraction used in the children's reason for grouping themselves with other children was used as the current measure of self-identification. Level of abstraction was scored on the following continuum: no answer or don't know (0); inaccurate concrete response or uncertain response (1); accurate concrete description referring to a cultural characteristic or Mexican-type appearance (2); and accurate and abstract description which referred to the culture (3). Children received scores based on the complexity of their response, therefore, increasing scores indicated a higher level of complexity and understanding about one's ethnicity.

Ethnic Constancy. Next, 5 questions were asked to assess the children's awareness that their ethnicity would remain constant over time (ethnic stability: 2 questions), settings, and physical transformations (ethnic consistency: 3 questions). For example, children were asked, "When you become a grown up person, will you be Mexican?" (ethnic stability), and "If you changed your hair colour to blond, would you be Mexican?" (ethnic consistency). Questions were modelled after the gender constancy scale of Slaby and Frey (1975). The constancy score was the number of constancy responses to the five questions. Cronbach's alpha for this scale was .62.

Ethnic Knowledge. The children were then asked to imagine two towns that were represented by drawings that were referred to as the "Anglo" town and "Mexican" town. Children were given a pre-test to assess their ability to differentiate between the two towns, which were identical in appearance, but were labelled as the "Anglo" or "Mexican" town. Children were instructed until they could correctly identify each town and then asked questions regarding stereotypical group behaviours from the Mexican culture. Children were asked how often these group behaviours might occur in either the Anglo town or the Mexican town. For example, "How often do people in the Mexican town eat menudo?" and "How often do people in the Anglo town eat menudo?" Responses were recorded as 1 = "never," 2 = "sometimes," and 3 = "always". The children's Ethnic Knowledge score was determined by averaging the difference score for each item in the "Anglo" town from the matching item in the "Mexican" town. There were a total of six pairs of items that reflected knowledge of Mexican behaviours. Cronbach's alpha for this scale was .71.

Children's Cognitive Ability. The children's level of cognitive ability was assessed using a Conservation of continuous quantity (water) task and a Classification (class inclusion) Task (Piaget, 1951).

Conservation of continuous quantity. Children were presented with two identical glasses partially filled with water. After ensuring that the children understood the concepts of “more” and “same”, they were asked to pour the contents of one glass (A1) into a long, narrow glass container (B). The question, “Does one glass have more water to drink?” was posed and they were asked to indicate which glass, if any, had more water. The children were then asked to explain why they thought both quantities were the same or different. Their answers were recorded verbatim. After restoring equality within the two identical glasses (A1 and A2), the contents of one glass (A1) was poured into six small plastic containers (C). The same questions were asked of the children as in the first part of the task, with wording changes that reflected the new transformation.

Classification (class inclusion). Children were presented with 10 wooden beads; 8 red beads and 2 white beads. First, the experimenter determined that the children understood that all the beads were made of wood and could identify the two colours. Next, the children were asked the classification question: “In this jar, are there more wooden beads or more red beads?” Children were then asked to justify their answer with the question, “Why are there more — (child’s answer) beads?” The second classification question consisted of a story about two girls making a necklace. The children were asked if the necklace with the red beads or the necklace with the wooden beads was longer and were asked to justify their answer, as with the first question.

For both tasks, if children’s answers were inconsistent between the first and second transformations within the task, the experimenter asked them to choose one argument. The experimenter then counter suggested the children’s argument and presented the correct conserving or classifying position to the nonconservers and the nonconserving position to the correct conservers or classifiers. The children were then asked to explain this opposing point of view.

Within the Conservation task, children were given a score of 3 and labelled as concrete-operational only if they responded correctly to the two transformation questions and were able to justify their responses to the probing and counter suggestions. The transformation questions consisted of “Does one of these glasses have the same amount (more) to drink?” The children were then asked to tell why there was the same amount (or more) and had to provide one of the following three arguments in order to be considered correct: identity, compensation, or reversibility. Identity refers to the argument that the amounts are the same because it was the same before and nothing had been added or taken away. Compensation implies that the change in one direction was compensated by a corresponding change in another dimension, such as glass B is taller, but it is thinner as well. Reversibility implies that the two glasses have the same amount of water

because the water in the transformed glass could be returned to its original state. Children who could give a correct response to one or both of the transformation questions but could not adequately justify their response were given a score of 2 and labelled as transitional. Children were given a score of 1 and labelled as pre-operational if they could not provide a correct response to either of the transformation questions and did not demonstrate an understanding that the transformation was perceptual only.

Within the Classification task, children were required to respond correctly to the two classification questions and justify their answer with a statement demonstrating reversibility of thought. The class questions consisted of "Are there more red beads (wooden beads) or wooden beads (red beads)?" Based on the traditional Piagetian scoring system, children were labelled as concrete operational and given a score of 3 if they could compare the extension of the whole (wooden) with the extension of one of its parts (red). The hierarchical structure is understood with a response such as, "There are more wooden beads than red beads because the red and white beads are all made of wood". Children were labelled as transitional and given a score of 2 if they were able to answer one or both of the transformation questions correctly but were unable to adequately justify their answer. Children who consistently said that there were more red beads than wooden beads were comparing the two complementary classes (red and white) together and were given a score of 1 and labelled as pre-operational.

RESULTS

Inter-rater Reliability

Inter-rater agreement on the recording of the children's ethnic identity measure was assessed by two independent coders on 29% of the children's protocols. This was done to ensure that responses were recorded accurately by the experimenters. The total number of agreements between coders across all protocols was calculated and divided by the total number of responses (93) possible across the subsample to yield 99% agreement. Inter-rater agreement scores for each scale were: Ethnic Label, 99%; Ethnic Constancy, 100%; and Ethnic Knowledge, 99%.

Inter-rater reliability on the scoring of the Reason for Self-Grouping score was obtained by two independent scorers on 25% of the sample. The total number of agreements between scorers across all subjects was divided by the total number of cases in the subsample that yielded 96% agreement for this score of children's reasoning.

Tape-recordings of the children's responses on the Classification and Conservation Tasks were transcribed for scoring purposes and scores of 1, 2, or 3 were assigned based on the criteria previously described for pre-operational, transitional, and concrete operational thinking. Inter-rater

reliability was obtained for the Classification and Conservation scores on 25% of the sample based on tape transcriptions, which yielded 96% agreement. Fuson, Lyons, Pergament, Hall, and Kwon (1988) reported comparable inter-rater reliability figures (90%, 95%, and 99%) in three studies using similar recording and scoring criteria.

Validity Data for Ethnic Identity Measures

Several other studies (Bernal et al., 1990; Knight, Bernal, Cota, Garza, & Ocampo, 1993a; Knight, Bernal, Garza, Cota, & Ocampo, 1993c; Knight, Cota, & Bernal, 1993d; Knight, Garza, & Bernal, 1995) have utilised the current measures of ethnic identification, ethnic constancy, and ethnic knowledge. Bernal et al. (1990) reported that ethnic identification was significantly correlated with ethnic constancy and ethnic knowledge ($r = .41$ and $.22$, respectively; $P < .05$) in their study. In the current study, ethnic identification was significantly correlated ($P < .05$) with ethnic constancy and ethnic knowledge ($r = .16$ and $.17$, respectively), and ethnic constancy was significantly related to ethnic knowledge ($r = .17$, $P < .05$). (These correlations are also listed in Table 3.)

The current measures of ethnic identity components have also demonstrated significant correlations with related measures, providing support for the validity of the current measures. In a recent study Knight, Cota, and Bernal (1993d) reported that the components of ethnic identification and ethnic knowledge were related to mother's teaching about the Mexican culture ($r = .20$, $P < .10$; $r = .27$, $P < .05$, respectively). In addition, significant correlations ($P < .05$) were also found between ethnic identification and ethnic knowledge and an ethnically reinforced social behaviour—concern for other's resources ($r = .32$ and $.24$, respectively). The ethnic knowledge measure was also found to be significantly related to another ethnically reinforced social behaviour—children's use of Spanish at home ($r = .51$, $P < .001$), and father's generation level ($r = .34$, $P < .01$) in an earlier study by Knight et al. (1993a). The component of ethnic constancy was not used in the analyses of these studies because the samples were comprised of older children, resulting in little variance in ethnic constancy.

Knight et al. (1993d) also assessed the validity of the ethnic identity measures with an investigation of the measures within a socialisation model of the transmission of ethnic identity. The covariances among the variables in the socialisation model were examined through Maximum Likelihood Structural Equations Modelling. A good model fit was found, whereby mother's ethnic background was related to mother's teaching about Mexican culture, which was related to child ethnic identity (including the components of ethnic identification and ethnic knowledge), which in turn was related to their co-operative, competitive, and individualistic

preferences (concern for other's resources—an ethnically reinforced social behaviour).

Finally, Knight et al. (1995) examined the structure of ethnic identity using the current measures of ethnic identity components and the larger sample from which the current sample was drawn. The component of self-identification was not included in the analyses because the majority of children in the sample had self-identified correctly, resulting in little variance within this measure. Latent structure modelling and correlational analyses supported the multidimensional structure of ethnic identity. A confirmatory factor analysis supported the breakdown of children's ethnic identity into the component structure outlined by Bernal et al. (1990), which included ethnic constancy and ethnic knowledge. The data fit the model well and all items within each component measure loaded significantly ($P < .05$) on the predicted measure.

Demonstration of Age Differences

Preliminary analyses were conducted in order to investigate the scale properties of the ethnic constancy scale. Three of the five items in the ethnic constancy scale were correlated with age, whereas the combined scale was also significantly correlated with age ($r = .18$, $P < .05$). Further age differences in ethnic constancy were found with the formation of a Guttman scale, which has been used in studies of gender identity (Brenes et al., 1985; Slaby & Frey, 1975) to demonstrate the developmental sequencing of self-identification and constancy. A Guttman scale for ethnic self-identification and constancy was conducted, based on subjects' answers to the sets of questions pertaining to ethnic self-identification, ethnic stability, and ethnic consistency. A scalogram analysis revealed a reproducible Guttman scale (coefficient of reproducibility = .97). Table 2 presents the results of the scalogram analysis. One hundred of the 103 subjects showed one of the four stage-type patterns of response, which is similar to other studies utilising social constancy scales (Brenes et al., 1985; Slaby & Frey, 1975). In addition, mean stage scores and success on each question set increased with age.

Table 3 presents means and standard deviations for the children's overall performance on each component of the Ethnic Identity measure and the two cognitive tasks. For descriptive purposes, the table separates the children into two groups, older (> 90 months) and younger children (< 90 months), and provides mean scores and standard deviations for the ethnic identity variables. In all other analyses, months of age was used as a continuous variable. The scores for all the components increased from the younger to the older age group.

TABLE 2
Guttman Scale Analysis of Ethnic Constancy

	<i>Ethnic:</i>			<i>Children in Each Stage %</i>	<i>Mean (mths)</i>
	<i>Identification</i>	<i>Stability</i>	<i>Consistency</i>		
<i>Stage</i>					
1	-	-	-	13.6	82.6
2	+	-	-	35	88.3
3	+	+	-	32	94.1
4	+	+	+	16.5	96.8
<i>Nonstage</i>					
A	+	-	+	1.9	
B	-	+	-	0	
C	-	+	+	1.0	
D	-	-	+	0	

Test of Mediation

Before one can demonstrate a mediational relationship whereby the variance in cognitive ability accounts for the age differences in ethnic identity, several preliminary relations must be established (Baron & Kenny, 1986). First, age must be significantly related to ethnic identity. Second, age must be significantly related to level of cognitive ability. Third, level of

TABLE 3
Intercorrelation Matrix and Mean Performance Scores on Ethnic Identity Scales and Cognitive Ability Tasks by Age Group

<i>Measures</i>	<i>Age Group</i>		r^{2a}	r^{2b}
	<i>5-7 years (n = 51)</i>	<i>8-10 years (n = 52)</i>		
	<i>M (SD)</i>	<i>M (SD)</i>		
<i>Ethnic identity</i>				
Ethnic self-identification	.98(1.12)	1.69(1.18)	.16	.17
Ethnic constancy	3.25(1.47)	3.62(1.55)		.17
Ethnic knowledge	.30 (.52)	.64 (.55)		
<i>Cognitive ability</i>				
Classification Task	1.43 (.54)	1.94 (.80)		
Conservation Task	1.67 (.52)	1.94 (.46)		

Note: The sample was split at 90 months to provide descriptive data for means and standard deviations in this table only. In all other analyses, months of age was used as a continuous variable.

^a Correlations with ethnic constancy. ^b Correlations with ethnic knowledge.

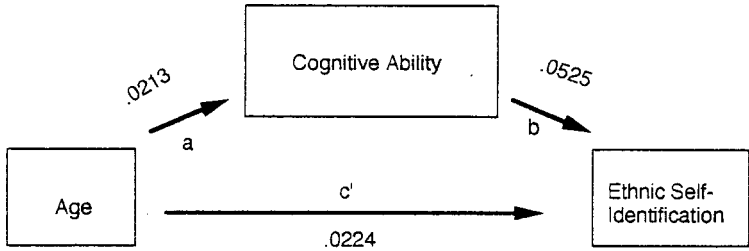
cognitive ability must be significantly related to the children's ethnic identity. Multivariate multiple regression analyses indicated that the three preliminary relationships necessary in the test of mediation were significant.¹ The ethnic identity components served as the dependent variables in the equations, whereas age and level of cognitive ability served as the independent variables, which were expected to predict changes in ethnic identity. Age was significantly related to level of cognitive ability, [$F(1,101) = 16.58, P < .001$], and to the ethnic identity variables, multivariate [$F(4,98) = 9.20, P < .001$]. Age accounted for 27% of the total variance in ethnic identity. The structure coefficients (in parentheses) demonstrated that ethnic self-identification (.67), and degree of ethnic knowledge (.60) significantly increased with age.

Level of cognitive ability was also significantly related to the ethnic identity variables, multivariate [$F(4,98) = 3.77, P < .01$]. Cognitive ability accounted for 13% of the total variance in ethnic identity. The structure coefficients revealed that amount of ethnic knowledge (.89) was the only individual ethnic identity component significantly associated with children's level of cognitive ability (ethnic self-identification, .37, and ethnic constancy, .15).

MacKinnon and Dwyer (1993) explain that mediation depends on the extent to which age accounts for changes in cognitive ability (a), and the extent to which cognitive ability affects each ethnic identity component (b). Following this technique to determine mediation, two regression equations were conducted with each ethnic identity variable. In the first regression analysis, the ethnic identity variable was regressed on cognitive ability. In the second regression analysis, cognitive ability was entered as another independent variable in the equation.

Mediation was assessed separately for each ethnic identity component. Figure 1 depicts the mediational relationship of age, cognitive ability, and the component of self-identification to provide an example of how mediation was assessed. First, ethnic self-identification was regressed on cognitive ability, producing the estimated coefficient relating cognitive ability to ethnic self-identification (.0525; path b in this model). Second, the coefficient relating age to cognitive ability is computed (.0213; path a in this model). The product of these two coefficients ($a \times b$) is the mediated, or

¹ Individual preliminary regression analyses were conducted between each cognitive and ethnic identity variable with gender to determine if gender significantly influenced children's cognitive ability or ethnic identity. Ethnic knowledge was the only component that demonstrated a significant age by gender interaction ($P < .05$). Females were found to have slightly more ethnic knowledge ($M = .51, SD = .56$) than males ($M = .43, SD = .56$). As the relations between age and ethnic knowledge were in the same direction, males and females were combined together for the multivariate multiple regression analyses.



Indirect (mediated) effect of age = $a \times b = ab = .0011$

Direct effect of age = $c' = .0224$

Total effect of age = $ab + c' = .0235$

Percent of age effect mediated by cognitive ability = $ab/(ab+c') = .047$

FIG. 1. Mediational relationship of age, cognitive ability, and ethnic self-identification.

indirect effect of age (.0011). Table 4 lists the indirect effects of age on ethnic self-identification, ethnic constancy, and ethnic knowledge.

Next, ethnic self-identification was regressed on age, and cognitive ability was entered as another independent variable in the equation. This coefficient relating age to ethnic identity adjusting for cognitive ability is the nonmediated, or direct effect of age (.0224; path c' in this model on Fig. 1). The total effect of age on ethnic self-identification is thus the summation of the direct effects of age (c') and the indirect effects of age ($a \times b$). A test of significance was then conducted between the total effect of age and the mediated effect of age for ethnic self-identification. MacKinnon and Dwyer (1993) discussed a test of significance whereby the estimate of the mediated, or indirect effect, is divided by its standard error, yielding a z -statistic. This set of analyses was also conducted for the ethnic constancy and ethnic

TABLE 4
Effect of Age on Ethnic Identity Components

<i>Ethnic Identity Variables</i>	<i>Total Effect of Age</i>	<i>Indirect Effect of Age</i>	<i>Effect Mediated (%)</i>
Ethnic self-identification	.024**	.001	4.7
Ethnic constancy	.014	-.000	1.7
Ethnic knowledge	.010**	.003*	30.6

* $P < .05$; ** $P < .01$.

knowledge components. Cognitive ability was found to be a significant mediator for only the ethnic knowledge component.

The percent of the age effect mediated by cognitive ability was found by dividing the indirect effect of age by the total effect of age. The percent of the age effect that was mediated and the total effect of age are also presented in Table 4 for each ethnic identity component. Ethnic knowledge was the only component that demonstrated a considerable proportion of the age effect as mediated by cognitive ability level.

Semi-partial Correlation Analyses

Table 5 provides Pearson product-moment correlations between the ethnic identity variables and age, and between the ethnic identity variables and level of cognitive ability. In addition, the semi-partial correlations of age and the ethnic identity variables with level of cognitive ability partialled out are presented, as well as the semi-partial correlations of cognitive ability level and the ethnic identity variables with age partialled out of the equation. These findings demonstrate that the correlations of age with ethnic self-identification and ethnic constancy were virtually unchanged when level of cognitive ability was removed. However, there was a decrease in the significance levels in the correlations between age and ethnic knowledge when level of cognitive ability was statistically controlled. The correlations between the ethnic identity components of ethnic self-identification and ethnic constancy with cognitive ability were sharply reduced when variance due to age was removed from the equation. On the other hand, the correlation between ethnic knowledge and cognitive ability remained significant when the effects of age were removed.

DISCUSSION

The age differences in cognitive ability did not account for the age differences in ethnic self-identification and ethnic constancy as predicted by cognitive developmental theory. The correlations of age with ethnic identification and ethnic constancy remained virtually unchanged when the effects of level of cognitive ability were statistically removed. However, the age differences in the ethnic knowledge component were partially explained by age differences in cognitive ability as the correlation between age and ethnic knowledge decreased significantly when the effects of cognitive ability were statistically removed. In addition, significant mediation was found only for the ethnic knowledge component of ethnic identity. A substantial proportion of the age differences in ethnic knowledge were found to be a function of age differences in cognitive ability. On the whole, the results do not support the assumption made by researchers of social identities that developmental changes seen in the components of self-

TABLE 5
 Partial Correlations between Ethnic Identity, Age, and Cognitive Ability

<i>Ethnic Identity</i>	<i>Age</i>	<i>Age with Cognitive Ability Removed</i>
Ethnic self-identification	.351**	.315**
Ethnic constancy	.180*	.170***
Ethnic knowledge	.315**	.216*

<i>Ethnic Identity</i>	<i>Cognitive Ability</i>	<i>Cognitive Ability with Age Removed</i>
Ethnic self-identification	.168*	.045
Ethnic constancy	.059	-.008
Ethnic knowledge	.367**	.257**

* $P < .05$; ** $P < .01$; *** $P < .10$.

identification and constancy are due to the advancement of concrete operational thought.

The results of the Guttman scalogram for ethnic self-identification and ethnic constancy found in the current study indicated age changes which were comparable to those found by investigators of gender, racial, and ethnic constancy (Aboud, 1984; Bernal et al., 1990; Brenes et al., 1985; Semaj, 1980; Slaby & Frey, 1975). However, these age changes may not be due to changes in cognitive development and the ability to conserve, decentre, and classify as hypothesised by the above-mentioned researchers. Although a Guttman scalogram may demonstrate predicted increases in the ability to understand one's group membership and the constancy of group membership with age, this evidence does not necessitate a cognitive developmental theoretical mechanism. That is, all the Guttman scalogram demonstrates is a set of predicted age differences, which may or may not be due to changes in cognitive development. Therefore, children may learn to self-identify with a group before they understand that their membership is permanent. However, such age changes may be due to another process (e.g. socialisation), rather than a change from preoperational to concrete operational thinking.

Researchers (Aboud, 1984; Clark et al., 1980; Semaj, 1980) have cited significant correlations between measures of gender, racial, and ethnic identity and measures of physical conservation as evidence for their theory. It is possible that significant relations between social identities and the ability to solve physical conservation problems may be related to a third factor, such as increases in learning with age, rather than indicative of a causal link between the two. Figure 2 depicts two models compatible with significant correlations between age, cognitive ability, and social identities. In model A, cognitive ability and social identities are correlated for spurious reasons. That is, cognitive ability and social identities are correlated because

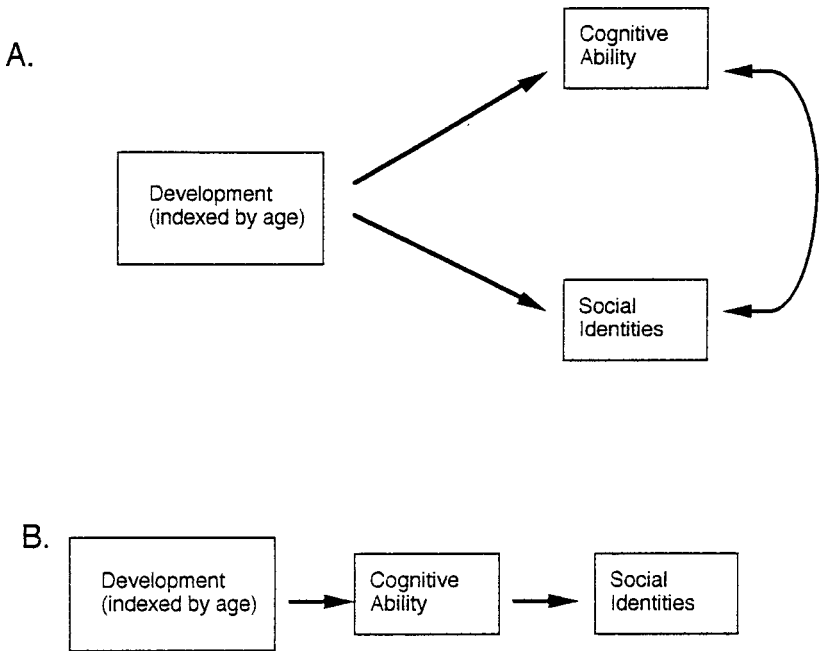


FIG. 2. Two models compatible with significant correlations between age, cognitive ability, and social identities.

they both are related to age. However in model B, the correlation between cognitive ability and social identities is causal and indicative of mediation. If one applied MacKinnon and Dwyer's (1993) test of mediation analyses in model A, one would obtain results similar to those found in the current study, where cognitive ability was not found to be a significant mediator of the age differences in ethnic identification and constancy. In contrast, if one applied MacKinnon and Dwyer's (1993) analyses in model B, the results would demonstrate that cognitive ability was a significant mediator in explaining the age differences found in social identities.

Given that the age differences in ethnic constancy were not found to be attributable to changes in level of cognitive ability, it is also possible that constancy is related to other age-related phenomena, such as the effects of socialisation. Knight, Bernal, Garza, and Cota (1993b) discussed the importance of parent's background and socialisation agents in the development of children's ethnic identity. They outlined a socialisation model whereby familial agents communicate ethnic content through their teaching and child-rearing practices. What parents teach and model about their culture may be influenced by variables such as acculturation, length of time in the United States, and socioeconomic status level. Three studies

(Knight et al., 1993a, c, d) reported empirical support for their socialisation model through correlational analyses and Structural Equations Modelling.² The results demonstrated that mother's ethnic background was related to mother's teaching about Mexican culture, which was related to children's ethnic identity, which in turn was related to ethnically reinforced social behaviours. It is possible that age changes found in ethnic identity may be related to increased learning through both familial and nonfamilial socialisation. Parent's teaching combined with knowledge acquired through school and peer experiences may strongly affect the development of group self-identification and constancy. Information gained through socialisation may be reflected in age differences, however, these age differences would not be the result of changes in level of cognitive ability.

If the age changes found in social identities are not entirely due to changes in cognitive ability level, it would follow that the development of in-group pride and prejudice against others could also be significantly influenced by other factors. Aboud (1988) emphasised the importance of concrete operational thought and the ability to conserve in the development of ethnic constancy and feelings of pride and prejudice. It may be that the age differences Aboud (1988) reported in children's feelings of prejudice may reflect a more developed ethnic schema, whereby with age, children are better able to integrate and utilise information about their own and other ethnic groups. The development of a richer ethnic schema may explain age shifts found around age 7, when children's feelings of prejudice against other groups appears to change. If the development of ethnic self-identification and constancy may be affected by noncognitive factors, such as socialisation, then the development of in-group pride and prejudice may also be influenced by socialisation factors. Aboud and Doyle (1993) discuss the possible importance of social forces in the development of in-group pride. However, these socialisation agents may be more critical than Aboud and Doyle hypothesised, given the lack of support for the relationship between cognitive ability and ethnic identity found in the current study.

The results of the current study indicate that age differences in ethnic knowledge may be explained by changes in cognitive ability level. It is possible that the ability to decentre, conserve, and use more complex cognitive processes may alter the way knowledge of one's ethnic group is acquired or incorporated into an ethnic schema. Although socialisation agents and increased exposure to information about one's ethnicity would also be important in acquiring ethnic knowledge, changes in cognitive ability

² Data used in the current study were part of the same larger data set as that used by Knight et al. (1993d). Information on ethnically reinforced social behaviours were not available for all subjects used in the analyses of the current study, therefore, a full investigation of the socialisation model was not possible within the current study.

level may be necessary for ethnic knowledge to develop fully and mature. It is unclear why ethnic knowledge was the only component of ethnic identity to demonstrate this relationship, given that cognitive developmental theorists, such as Kohlberg (1966), focused on the importance of cognitive ability in developing social constancy skills.

It is possible that the absence of support for the expected covariance relationship between age differences in ethnic constancy and cognitive development within the current study may have been due to measurement problems associated with the use of the 5-item ethnic constancy scale modelled after the gender identity scale of Slaby and Frey (1975). A number of researchers have criticised this type of constancy measure because of its use of hypothetical questions and the specific sequencing of questions used in the measure (Aboud, 1984; Martin & Little, 1990; Siegal & Robinson, 1987). Although this possibility exists, it appears unlikely because the scale demonstrated good reliability for a short scale, comparable to that of the ethnic knowledge measure. In addition, the correlations of ethnic constancy and cognitive ability would remain small when corrected for attenuation due to measurement error (i.e. the corrected correlation between ethnic constancy and level of cognitive ability is $r = .06$ assuming .60 and 1.0 reliabilities respectively, and is $r = .08$ assuming a .60 reliability for both measures). Finally, the results of the Guttman scalogram indicated that the constancy scale used in the present study operated in a way comparable to those used in previous investigations of other social constancies. Therefore, the lack of support for mediation by cognitive development within ethnic constancy is not likely due to problems with the constancy scale that are unique to the current study.

Although the cognitive tasks used in the current study allowed for the detection of significant relations, possible measurement problems concern the adaptations of Piaget's cognitive tasks that were used. Several investigators have questioned the ability of Piaget's original tasks to detect true cognitive stage differences (Fuson et al., 1988; Markman & Seibert, 1976; Wohlwill, 1968) because they feel that the tasks use confusing language that may underestimate children's ability to recognise concepts. Two separate cognitive tasks were administered, conservation of continuous quantity and classification (class inclusion), in order to provide evidence supporting competency in concrete operations. Chandler (1991) cautioned against assuming concrete operational abilities based on a single cognitive task, therefore, the use of two separate tasks may have provided a more reliable estimate of children's cognitive abilities. The adaptations of Piaget's conservation and classification tasks that were used in this study utilised fairly stringent criteria for determining cognitive stage, involving clear justification and explanation of classifying responses to be scored as concrete-operational responses. Although the other adaptations that use

alternate language or more lenient scoring criteria may merit attention, the adaptations used in the current study were consistent with a strict Piagetian interpretation, and thus, may be most consistent with cognitive developmental theory.

In summary, the current study did not find the anticipated mediation in the expression of ethnic identity due to level of cognitive ability. However, the data did indicate that the age differences in ethnic knowledge were mediated by age differences in cognitive ability. The importance of social constancy remains unclear, as does the specific pathway that links constancy to cognitive development. It may be that an increased understanding of social constancy reflects learning through socialisation mechanisms. However, research may benefit from a departure from cognitive developmental theory and from increased attention to other ideas, such as the importance of socialisation agents, that may be more empirically related to social role development.

Manuscript received February 1996

Revised manuscript received October 1996

REFERENCES

- Aboud, F.E. (1977). Interest in ethnic information: A cross-cultural developmental study. *Journal of Cross-Cultural Psychology*, 7, 289-300.
- Aboud, F.E. (1980). A test of ethnocentrism with young children. *Canadian Journal of Behavioural Science*, 9, 134-146.
- Aboud, F.E. (1984). Social and cognitive bases of ethnic identity constancy. *Journal of Genetic Psychology*, 145, 217-230.
- Aboud, F.E. (1987). The development of ethnic self-identification and attitudes. In J.S. Phinney & M.J. Rotheram (Eds.), *Children's ethnic socialization* (pp. 32-55). Newbury Park, CA: Sage.
- Aboud, F.E. (1988). *Children and prejudice*. Cambridge, MA: Blackwell.
- Aboud, F.E., & Doyle, A.B. (1993). The early development of ethnic identity and attitudes. In M.E. Bernal & G.P. Knight (Eds.), *Ethnic identity: Formation and transmission among Hispanics and other minorities* (pp. 47-59). Albany, NY: State University of New York Press.
- Baron, R.M., & Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173-1182.
- Bernal, M.E., Knight, C.P., Garza, C.A., Ocampo, K.A., & Cota, M.K. (1990). The development of ethnic identity in Mexican American children. *Hispanic Journal of Behavioral Sciences*, 12, 3-24.
- Bernal, M.E., Knight, G.P., Organista, K., Garza, C., & Maez, B. (1993). The young Mexican-American child's understanding of ethnic identity. In M.E. Bernal & P.C. Martinelli (Eds.), *Mexican American identity* (pp. 75-89). Encino, CA: Floricanto.
- Brenes, M.E., Eisenberg, N., & Helmstadter, G.C. (1985). Sex role development of preschoolers from two-parent and one-parent families. *Merrill-Palmer Quarterly*, 31, 33-46.

- Carter, D.B., & Levy, G.D. (1988). Cognitive aspects of early sex-role development: The influence of gender schemas on preschoolers' memories and preferences for sex-typed toys and activities. *Child Development, 59*, 782-792.
- Chandler, M. (1991). Alternative readings of the competence-performance relation. In M. Chandler & M. Chapman (Eds.), *Criteria for competence: Controversies in the conceptualization and assessment of children's abilities* (pp. 5-18). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.
- Clark, A., Hocevar, D., & Dembo, M.H. (1980). The role of cognitive development in children's explanations and preferences for skin color. *Developmental Psychology, 16*, 332-339.
- Coker, D.R. (1984). The relationships among gender concepts and cognitive maturity in preschool children. *Sex Roles, 10*, 19-31.
- DeAvila, E.A., & Duncan, S.E. (1990). *LAS language assessment scales*. Monterey, CA: CTB.
- De Lisi, R., & Gallagher, A.M. (1991). Understanding the gender stability and constancy in Argentinian children. *Merrill-Palmer Quarterly, 37*, 483-502.
- Eisenberg, N. (1983). Sex-typed toy choices: What do they signify? In M.B. Liss (Ed.), *Social and cognitive skills: Sex roles and children's play* (pp. 45-70). New York: Academic Press.
- Emmerich, W., Goldman, K.S., Kirsh, B., & Sharabany, R. (1977). Evidence for a transitional phase in the development of gender constancy. *Child Development, 48*, 930-936.
- Fuson, K.C., Lyons, B.G., Pergament, G.G., Hall, J.W., & Kwon, Y. (1988). Effects of collection terms on class-inclusion and on number tasks. *Cognitive Psychology, 20*, 96-120.
- Knight, G.P., Bernal, M.E., Cota, M.C., Garza, C.A., & Ocampo, K.A. (1993a). Family socialization and Mexican American identity and behavior. In M.E. Bernal & G.P. Knight (Eds.), *Ethnic identity: Formation and transmission among Hispanics and other minorities* (pp. 105-129). Albany, NY: State University of New York Press.
- Knight, G.P., Bernal, M.E., Garza, C.A., & Cota, M.C. (1993b). A social cognitive model of the development of ethnic identity and ethnically-based behaviors. In M.E. Bernal & G.P. Knight (Eds.), *Ethnic identity: Formation and transmission among Hispanics and other minorities* (pp. 213-234). Albany, NY: State University of New York Press.
- Knight, G.P., Bernal, M.E., Garza, C.A., Cota, M.C., & Ocampo, K.A. (1993c). Family socialization and the ethnic identity of Mexican American children. *Journal of Cross-Cultural Psychology, 24*, 99-114.
- Knight, G.P., Cota, M.C., & Bernal, M.E. (1993d). The socialization of cooperative, competitive, and individualistic preferences among Mexican American children: The mediating role of ethnic identity. *Hispanic Journal of Behavioral Sciences, 15*, 291-309.
- Knight, G.P., Garza, C.A., Bernal, M.E. (1995). *The structure of ethnic identity among Mexican American children*. Unpublished manuscript, Arizona State University, Department of Psychology, Tempe.
- Kohlberg, L. (1966). A cognitive-developmental analysis of children's sex-role concepts and attitudes. In E.E. Maccoby (Ed.), *The development of sex differences*. Stanford, CA: Stanford University Press.
- Levine, E., & Ruiz, R. (1978). An exploration of multi-correlates of ethnic group choice. *Journal of Cross-Cultural Psychology, 9*, 179-190.
- MacKinnon, D.P., & Dwyer, J.H. (1993). Estimating mediated effects in prevention studies. *Evaluation Review, 17*, 144-158.
- Marcus, D.E., & Overton, W.F. (1978). The development of cognitive gender constancy and sex role preferences. *Child Development, 49*, 434-444.
- Markman, E.M., & Seibert, K.J. (1976). Classes and collections: Internal organization and resulting holistic properties. *Cognitive Psychology, 8*, 561-577.
- Martin, C.L., & Little, J.K. (1990). The relation of gender understanding to children's sex-typed preferences and gender stereotypes. *Child Development, 61*, 1427-1439.
- Piaget, J. (1951). *The child's conception of the world*. New York: Humanities.

- Rotheram, M.J., & Phinney, J.S. (1987). Introduction. Definitions and perspectives in the study of children's ethnic socialization. In J.S. Phinney & M.J. Rotheram (Eds.), *Children's ethnic socialization* (pp. 10-28). Newbury Park, CA: Sage Publications.
- Semaj, L. (1980). The development of racial evaluation and preference: A cognitive approach. *Journal of Black Psychology*, 6, 59-79.
- Siegal, M., & Robinson, J. (1987). Order effects in children's gender constancy responses. *Developmental Psychology*, 23, 203-208.
- Slaby, R.G., & Frey, K.S. (1975). Development of gender constancy and selective attention to same sex models. *Child Development*, 46, 849-856.
- Wohlwill, J. (1968). Responses to class-inclusion questions for verbally and pictorially presented items. *Child Development*, 39, 449-465.

Copyright of International Journal of Behavioral Development is the property of Psychology Press (T&F) and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.