
Young Children's Perceptions of Cigarette Brand Advertising Symbols: Awareness, Affect, and Target Market Identification

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The author assesses young children's abilities to recognize cigarette brand advertising symbols and to identify adults as the appropriate target market for cigarettes. She used nonverbal measures in interviews with children three to eight years of age to assess how recognition of cigarette brand advertising symbols is related to age, cognitive developmental level, children's affect toward cigarettes, children's evaluation of cigarettes, and children's ability to identify adults as the appropriate target market for cigarettes. The results show that recognition of cigarette brand advertising symbols increases with age, as does overall recognition of brand advertising symbols in general. Regardless of age, cognitive developmental level, or recognition scores, children reported not liking cigarettes, believing cigarettes are "bad for you," and finding children to be an inappropriate target market for cigarettes. Findings are discussed in terms of social science and public policy, and in terms of the implications for cognitive development.

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Background and Study Focus

Since the publication of the December 1991 issue of the *Journal of the American Medical Association*, "Old Joe" the camel has come to symbolize the ongoing controversy about the appropriateness of using trade characters that appeal to children to advertise adult products. The issue of *JAMA* contained three studies examining the impact of Joe Camel and other cigarette brand advertising on children from three to 17 years of age. The studies collectively formed an indictment of cigarette advertising and individually concluded that "cigarette advertising may be an important health risk for children" (Fischer et al. 1991), public policy should ban all forms of cigarette advertising and promotion (Pierce et al. 1991), and "a total ban of tobacco advertising and promotion, as part of an effort to protect children from the dangers of tobacco, can be based on sound scientific reasoning" (DiFranza et al. 1991).

Partly on the basis of the conclusions of the three studies, the staff of the Federal Trade Commission (FTC) initially recommended, in August of 1993, that ads featuring Joe Camel be barred as a health hazard because they encourage minors to smoke (Teinowitz and Colford 1993). However, perhaps because of misgivings about evidence of the negative impact of Joe Camel, the FTC ultimately decided not to ban the cartoon character (Colford and Teinowitz 1994).

Disagreement on the validity and interpretation of the three studies' findings continues. Some researchers suggest that methodological problems in the studies make the findings suspect (Boddewyn 1993; Martin 1994; Mizerski, Sonner, and Straughn 1993). Fischer and his colleagues, in particular, sought to measure brand logo recognition among young children, but their conclusions are based on assumptions about behavior rather than recognition. Finding high levels of awareness of Joe Camel among young children, Fischer and his colleagues assumed a link between logo recognition and intended use, and concluded that cigarette advertising may be an important health risk for children. They did not, however, measure product-

related affect or intentions. Measures of awareness alone may not justify conclusions about affect, behavior, or behavioral intent.

Specifically, the high awareness of Joe Camel found among young children does not provide evidence that children like cigarettes, intend to use cigarettes, or accept cigarette smoking as appropriate behavior. A study was therefore designed to address this gap in the literature by assessing the relationship between awareness of brand advertising symbols (trade characters and trademarks) and attitudes toward advertised products among young children. The study investigated the role of variables that intervene between stimulus recognition and actual behavior, an important issue not addressed by previous research for the study's age group and product category. The study sought to determine how recognition of cigarette brand advertising symbols is related to age, cognitive developmental level, children's affect toward cigarettes, children's evaluation of cigarettes, and children's ability to identify adults as the appropriate target market for cigarettes.

The scope of the investigation was limited to perceptions of children between the ages of three and eight, a period of significant growth and change in the cognitive development of young children. Between those ages, children acquire and demonstrate the ability to perform increasingly complex cognitive tasks. Piagetian cognitive developmental theory was used as a framework for understanding the changes that occur in young children's information-processing abilities during that period.

Previous Research and Hypotheses

Age and Recognition of Brand Advertising Symbols

Several early studies of children and their perceptions of advertising are relevant to the investigation. Previous research has shown that children's understanding of advertising complexities increases with age and is related positively to other factors, including cognitive development, socioeconomic status, and adult-child interaction (Belk, Bahn, and Mayer 1982; Meyer, Donohue, and Henke 1978; Ward, Reale, and Levinson 1972).

Recent research from both social science and industry finds that awareness of cigarette trade characters is related to age, and is either unrelated or negatively related to affect for the trade character and for the product category. Mizerski (1992) found that positive

affect toward cigarettes was related negatively to age among children three to six years of age, whereas awareness of Joe Camel was related positively to age. Levin (1993) reported a positive relationship between age and awareness of Joe Camel among children from six to 17, but reported that the character's likability remained low across age groups among the same children. A national poll conducted by Roper Starch Worldwide found that although 73% of young people 10 to 17 years of age recognized Joe Camel, only 3% of those youths had a positive attitude toward smoking (Teinowitz 1994).

Cognitive developmental theory suggests that awareness of brands increases with age and is not necessarily related to positive attitude toward the brands or the product category. As children develop, their ability to identify, categorize, store, and retrieve information increases. Piagetian theory, for example, argues that children progress through a series of stages marked by qualitative changes in their information processing abilities. As age and stage evolve, so do memory and the ability to perform more complex cognitive tasks (Piaget 1955; Piaget and Inhelder 1969).

Previous research on age and awareness suggested the following hypotheses.

H1: Age is related positively to overall recognition of brand advertising symbols.

H2: Age is related positively to recognition of cigarette brand advertising symbols.

Age and Identification of Appropriate Target Audience

Previous studies of children's perceptions of advertising suggest that the ability to identify adults as the appropriate target market for cigarettes increases with age. Specifically, research has shown that as age and understanding increase, so does ability to separate advertisements from editorial or program content (Donohue, Henke, and Meyer 1983), understanding of the persuasive intent of ads and the concept of sponsorship (Meyer, Donohue, and Henke 1978; Ward, Reale, and Levinson 1972), skepticism about advertising claims (Bever et al. 1975), and understanding of the concept of market segmentation—that some products and ads are intended for some audience members and not for others (Belk, Bahn, and Mayer 1982; Donohue, Henke, and Donohue 1980; Henke 1980). Those findings have important implications. They demonstrate that, in fact, at the same time as children's ability to recognize brand logos is increasing, they are also developing skills of discrimination

and perspective-taking that would perhaps mitigate the potential influential effects of increased recognition.

Findings about age and increased understanding of advertising are not surprising in light of Piagetian developmental theory, which argues that the ability to engage in abstract thinking, perspective-taking, critical thinking, and the making of moral judgments increases with age and developmental stage (Flavell 1963; Ginsberg and Oppen 1969; Piaget 1955; Piaget and Inhelder 1969). Hence, one would expect that as a child's ability to remember brand advertising symbols increases with an increase in cognitive development, so does the ability to evaluate the brand and product category within an increasingly complex contextual framework. Children in the pre-operational stage, which begins around the age of two following the sensorimotor period and ends around the age of seven with entry into the concrete operational stage, would be expected to have difficulty with the concept that some television programs, products, or ads are not designed for them, and would therefore be expected to have little ability to identify adults as the target market for adult products.

Previous findings suggested the following hypotheses.

H3: Age is related positively to ability to identify adults as the appropriate target market for cigarettes.

H4: The relationship between recognition of brand advertising symbols and ability to identify adults as the appropriate target market for cigarettes is positive.

Age and Cognitive Developmental Stage

Piaget (1955; Piaget and Inhelder 1969) asserts in his cognitive developmental stage theory that children in the pre-operational stage are characterized by egocentrism, inability to engage in perspective-taking, and a tendency to make judgments on the basis of appearances or perceptual attributes. A pre-operational child, for example, judges five pennies that are spread far apart from each other to be "more" than five pennies that are lying side by side. To a pre-operational child, three ounces of water in a large, shallow container becomes "more" when poured into a tall, narrow container.

Following the pre-operational stage is the stage of concrete operations. Children in the concrete operational stage can perform mental manipulations, en-

gage in perspective-taking, and make judgments on the basis of information processing on both perceptual and deeper cognitive levels. They would be expected to understand target market segmentation and to identify the appropriate targets for products not intended for children.

Transition to Concrete Operations. It is not clear at what age the pre-operational stage ends and the concrete operational stage begins, but standard Piagetian tests of cognitive development generally place children younger than five or six years of age in the pre-operational stage and children older than seven in the concrete operational stage (Flavell 1963; Ginsberg and Oppen 1969; Sigel and Hooper 1968). However, the age of concrete operations is not fixed. First, some children enter the concrete operational stage sooner than others. Second, there appears to be a transition period between the pre-operational and concrete operational stages during which a child demonstrates some, but not all, abilities associated with concrete operations.

Abilities During Transition. There is evidence that the shift to concrete operations does not result in across-the-board development of abilities, but that some concrete operational skills develop earlier than others. For example, when nonverbal measures are used, some children demonstrate empathy and perspective-taking—skills attributed to the stage of concrete operations—as early as three years of age (Borke 1971; Donohue, Henke, and Donohue 1980; Henke 1980). Whether the ability to empathize develops prior to other concrete operational abilities or the nonverbal measures simply allow the skill to be demonstrated at an earlier age is not clear. The findings suggest, nevertheless, that each child undergoes a period of transition between the fully pre-operational and fully concrete operational stages, during which various skills are acquired and demonstrated. Thus, although cognitive development is related to age, age is not a predictor of developmental stage. The study therefore was designed to assess the relationship between the independent measures of both age and cognitive developmental level and the dependent measures of awareness of brand symbols and identification of target market. Specifically, the study addressed the following research questions.

Q1 How is age related to:

- (a) awareness of brand advertising symbols, a function of attention and memory, and

- (b) the ability to identify the appropriate target market for cigarettes, a function of the concrete operational skill of perspective-taking?

Q2 *How is cognitive developmental level related to:*

- (a) awareness of brand advertising symbols, a function of attention and memory, and
- (b) the ability to identify the appropriate target market for cigarettes, a function of the concrete operational skill of perspective-taking?

Method

Procedure

Interviews. Interviews with children in preschool through second grade were conducted by five undergraduate students and one child care professional. The interviewers participated in a training session to familiarize them with the study materials and to prepare them to conduct the interviews. Five of the six interviewers were unaware of the research questions being examined in the study. Interviewing took an average of 20 minutes per subject and was completed in three days.

Subject Assent and Parental Consent. Assent was obtained from each child before his or her interview took place. Children in classrooms were invited to participate in the interviewing session, which they were told included playing games and looking at pictures. Children who were interested were removed from the classroom one at a time and taken to a separate room where individual interviews were conducted. Interviewers were instructed to terminate the interview if visual and verbal cues indicated a subject's discomfort with the interview or unwillingness to continue. The children understood they were not required to participate in the interviewing. Only one child declined to be interviewed and one child terminated the interview before completion.

Parental consent forms were distributed during the week prior to interviewing. The consent form requested permission for the children to participate in a study of their perceptions of advertising. The forms gave the parents the option of receiving a summary of study results. One parent asked that her child not be interviewed. Five requested a summary of results.

Sample

The 83 subjects who participated in the study ranged in age from three to eight years. The children were from middle-class neighborhoods in and around a small coastal town in southern Maine. Fifty-four percent were boys.

Variables

Cognitive Developmental Level. In the first part of the interview, three tests of cognitive development were administered. As described previously, two tests of conservation of number (with pennies) and one test of conservation of liquid (with water) examined the children's abilities to separate appearance from reality and to make judgments on the basis of mental manipulations rather than perceptual attributes. A summary score was calculated for each child by adding the number of correct responses; possible resulting values were 0, 1, 2, or 3.

Recognition of Brand Advertising Symbols. The second part of the interview tested the subjects' ability to match brand advertising symbols to the product category represented by the brand. A 16" by 16" laminated board, consisting of photographs of various adults' and children's products, was introduced as a gameboard. There were 16 photographs representing 16 different product categories. To ensure that they understood the stimulus materials, the children were asked to point to various products on the gameboard as the interviewer named them in random order. The order in which products were named was not fixed, but varied across subjects. Because identification of the product categories on the gameboard was central to the study, the interviewer named any product categories that a subject could not recognize before continuing with the interview.

After identification of the 16 products, the interviewer introduced a packet of cards, each featuring a brand advertising symbol. The deck contained 23 cards. Twenty-two cards were used in the recognition test and one card was used in a practice match to ensure that the subjects had an understanding of the task. The twenty-two cards included one brand symbol for each of 11 product categories and two or three different brand symbols for each of the five other categories.

A summary score of *overall identification of brand symbols* was calculated for each child by adding the number of correct responses given in recognition tests

with the 22 brand cards. Possible values of the summary score ranged from 0 to 22.

Eleven of the cards portrayed trade characters representing adult and child product categories: batteries, beer, books, cereal, cigarettes, dairy products, dishwashing liquid, fast food, snack food, and tires. One card, featuring a logo without a trade character, was used in the practice match. The other 11 cards featured logos without trade characters, representing airlines, automobiles, beer, cigarettes, coffee, dairy products, electrical products, gasoline, and telephones. Table 1 reports the complete list of brand symbols.

A summary score of *identification of cigarette brand symbols* was calculated for each child by adding the number of correct matches made in recognition tests using the two cigarette brand symbols that had achieved highest recognition rates in the study by Fischer et al. (1991)—Camel's Old Joe and Marlboro's "red roof." Possible values of the score ranged from 0 to 2.

All visual references to the product category were removed from the logo cards for testing; the cigarette, for example, was masked on the Joe Camel card and the beer mugs were masked on the card for St. Pauli Girl. In addition, because many of the children being interviewed were learning to read or to "sound out" words, the brand signatures were masked to prevent internal verbalization from serving as a memory cue.

In the practice match, the interviewer presented a picture of the McDonald's arches and asked, "What is this a picture of? What does it go with on the gameboard?" Interviewing proceeded after the child demonstrated an understanding of the task.

For the recognition test, the interviewer presented the brand symbol cards one at a time in random order and the child placed the card on a product square. Each card was removed before the next card was presented. The deck of cards was shuffled between subjects.

Identification of Target Market. After the tests of recognition, the interviewer produced a packet of laminated cutout figures of young boys and girls and of men and women. Together, the interviewer and the child selected a set of cutouts to represent adults and children in the subject's family.

For each of a subset of six product categories the interviewer pointed to the photo on the gameboard and asked the child, "Who is this product for—is it for children or adults?" The child responded either verbally or nonverbally by using the cutouts. Responses were categorized as "adults," "children," or "don't know/no answer." The product categories used in the

target identification questions represented both children's and adults' products, including beer, books, cereal, cigarettes, hamburgers, and snack food. Interviewers rerandomized the tasks for each subject.

Affect for Product Categories. The same subset of products as were used in the target identification measure were used to assess affect. For each of the six product categories, the interviewer pointed to its photo on the gameboard and asked, "Do you like this product or do you not like this product?" The order in which products were tested was randomized across subjects. Responses were divided into categories of "like," "don't like," or "don't know/no answer."

Evaluation of Product Categories. In the final part of the interview, the same subset of six product categories was used to assess perceptions of the value of the product. Pointing in random order to photos of each of the six products, the interviewer asked, "Is this product good for you or bad for you?" Possible response categories were "good for you," "bad for you," "don't know/no answer."

After the child answered questions about the value of the six product categories, the interviewer thanked the child, commended him or her on a job well done, and terminated the interview.

Analyses

A series of analyses were performed on the data. Responses were cross-tabulated and subjected to chi-square analyses to identify age-related differences in recognition of brand advertising symbols and in identification of target audiences for brand advertising symbols. Chi-square analyses were also performed to assess the relationship between symbol recognition and target market identification measures for cigarette brands. Pearson product-moment correlations were conducted to assess the relationship of age in months to overall recognition of brand advertising symbols and to recognition of cigarette advertising symbols. Finally, a discriminant analysis was performed to identify which variables were the best predictors of children's ability to identify cigarette advertising symbols.

Results

Two of the four hypotheses are supported: H1, that overall recognition of brand advertising symbols increases with age, and H2, that recognition of cigarette brand advertising symbols increases with age. H3, that the ability to identify the appropriate target

Table 1
Summary of Hypothesis - Testing Results

H	Hypothesized Outcome	Analyses	Table Number	Significance	Outcome
1	Significant positive relationship between age and overall recognition of brand advertising symbols	• r between age and summary score for overall identification of brand symbols = .5921 • χ^2 for summary score of overall identification of brand symbols by age=20.44,d.f.=4	2 3	$p < .001$ $p < .0004$	Supported
2	Significant positive relationship between age and recognition of cigarette brand advertising symbols	• r between age and summary score for identification of cigarette brand symbols = .4240 • r between age and ability to identify Joe Camel = .3581 • χ^2 for summary score for identification of cigarette brand symbols by age=14.56,d.f.=4	2 2 4	$p < .001$ $p < .001$ $p < .006$	Supported
3	Significant positive relationship between age and ability to recognize adults as appropriate target market for cigarettes	• χ^2 for ability to identify adults as the appropriate target market for cigarettes by age = 4.41,d.f.=6	6	n.s.	Not supported: regardless of age, children identified adults as the appropriate target market for cigarettes
4	Significant positive relationship between recognition and target market identification scores	• χ^2 for ability to identify adults as the appropriate target market for cigarettes by: • summary score for identification of cigarette brand symbols=4.73,d.f.=6 • ability to identify Joe Camel=2.54,d.f.=3 • ability to identify the Marlboro "red roof" =1.48,d.f.=3	7 8 8	n.s. n.s. n.s.	Not supported: regardless of ability to identify cigarette brand symbols, children identified adults as the appropriate target market for cigarettes

Table 2
Recognition of Brand Symbols by Age

Brand Name	Brand Symbol	Total Sample (N=83) %	Age Group		
			Under 6 (41-72 Months) (n=28) %	6-7 (73-87 Months) (n=27) %	Over 7 (88-103 Months) (n=28) %
McDonald's	Ronald McDonald	95	93	93	100
Frosted Flakes	Tony the Tiger	95	86	100	100
Froot Loops	Toucan Sam	94	86	100	96
Budweiser	Red logo	94	82	100	100
Chee-tos	Chester Cheetah	89	79	93	96
Lite Beer	Blue logo	89	75	96	96
Oakhurst Dairy	Acorn symbol	87	86	85	89
Locust Farm Dairy	Locust Cow	84	75	89	89
Energizer	Energizer Bunny	82	61	85	100
Dr. Seuss	Cat in the Hat	82	61	93	93
Chevy	Chevy logo	75	50	85	89
Camel	Joe Camel	73	54	81	86
Folger's	Mountain	71	64	59	89
Bell	Bell symbol	55	39	59	68
Citgo	Triangle	48	43	55	46
Texaco	Star	45	29	59	46
St. Pauli	Pauli Girl	34	21	41	39
Michelin	Michelin Man	30	32	26	32
Marlboro	Red roof	27	7	26	46
Delta	Triangle	23	12	33	25
GE	GE circle	12	7	15	14
Dove	Dove symbol	8	5	13	8

market for cigarettes increases with age, and H4, that it increases with recognition, are not supported. None of the children in the study identified children as the appropriate target audience for cigarettes; only one said that cigarettes were for both children and adults. Therefore, because of the lack of variability in response, no correlations resulted for the measure of target market identification. Table 1 is a summary of findings for the four hypotheses. Specific findings follow.

Age and Recognition of Brand Advertising Symbols

Recognition of cigarette brand symbols increases with age, as does overall recognition of brand symbols

in general. Table 2 gives results of recognition tests for the three age groups that correspond to the pre-operational (younger than six years), transitional (between six years and seven years), and concrete operational (older than seven years) developmental levels. Age in months was used for the analyses.

Pearson's product-moment correlations reveal significant positive relationships between age in months and ability to identify Joe Camel ($r = .3581$, $p < .01$), summary score for identification of cigarette brand symbols ($r = .4240$, $p < .01$), and summary score for overall identification of brand symbols ($r = .5921$, $p < .01$). Table 3 reports the results of the correlation analysis.

Chi-square analyses also show a clear age effect in recognition of cigarette brand symbols as well as in

Table 3
Correlation Between Age and Identification of Brand Symbols
(N=83)

Identification Variables	Pearson's Product-Moment Correlation With Age in Months	p
Summary score of overall identification of brand symbols	.5921	<.01
Summary score of identification of cigarette brand symbols	.4240	<.01
Ability to identify Joe Camel	.3581	<.01

Table 4
Overall Recognition of Brand Advertising Symbols by Age

Summary Score	Total Sample (N=83) %	Age Group		
		Under 6 (41-72 Months) (n=28) %	6-7 (73-87 Months) (n=27) %	Over 7 (88-103 Months) (n=28) %
3-12	24	63	30	9
13-15	47	31	45	53
16-21	29	6	25	38
\bar{X}	13.94			
σ_M	1.41			

Chi-square test on frequencies. $\chi^2 = 20.44$, d.f. = 4, $p < .01$

overall recognition of brand symbols in general. (Summary score for overall identification of brand symbols by age: $\chi^2 = 20.44$, d.f. = 4, $p < .01$. Summary score for identification of cigarette brand symbols by age: $\chi^2 = 14.56$, d.f. = 4, $p < .01$). Tables 4 and 5 report overall recognition and cigarette recognition scores by age.

Comparison of Recognition Findings with Those of Previous Research

The findings on recognition of brand advertising symbols are not dissimilar to those of previous stud-

ies. As reported by Fischer et al. (1991) and Mizerski (1992), recognition rates for both children's and adults' product symbols show an increase with age. In addition, recognition rates specifically for Joe Camel among the youngest children in the study (54%) reflect the rates reported by Fischer (51%) and Mizerski (33% to 78% rates weighted by ages three to six).

Unlike Fischer's, however, the present study shows very high recognition rates for several adult product symbols besides Joe Camel. Recognition of the Energizer Bunny, for example, ranges from 61% to 100% for the three- to eight-year-olds tested. As shown in

Table 5
Recognition of Cigarette Brand Advertising Symbols by Age

Summary Score	Age Group		
	Under 6 (41-72 Months) (n=28) %	6-7 (73-87 Months) (n=27) %	Over 7 (88-103 Months) (n=28) %
0	43	18	11
1	54	56	50
2	4	26	39

Chi-square test performed on frequencies: $\chi^2 = 14.56$, d.f. = 4, $p < .01$

Table 1, other adult products with symbols recognized by at least half of the sample are Budweiser, Lite Beer, Oakhurst and Locust Farm (regional dairies), Chevrolet, Folger's, and Bell Telephone.

Recognition of Cigarette Brand Advertising Symbols: Discriminant Analysis

Discriminant analysis was conducted to answer the research questions and to determine which variables best predict children's ability to match cigarette brand advertising symbols with the cigarette product category. The analysis revealed that children who correctly matched the Camel trade character and the Marlboro "red roof" trademark and children who were unable to identify those cigarette brand symbols differed on three dimensions: cognitive development, overall brand-to-product matching ability, and gender. Age was not a predictor of ability to identify cigarette brand advertising symbols. Specifically:

1. Children with higher summary scores on the tests of cognitive development made correct matches for cigarette brands significantly more often than children with lower cognitive development scores.
2. Children with higher overall brand-to-product matching scores made correct cigarette matches significantly more often than children with lower overall matching scores.
3. Boys made correct matches of cigarette brands significantly more often than girls.

Three discriminant groups were used in the analysis. Group 1 consisted of children who correctly matched neither Joe Camel nor the Marlboro "red roof." Group 2 consisted of children who correctly matched only one of the cigarette brands. Children in group 3 correctly matched both of the cigarette brands.

Four variables were included as predictor variables and were considered in the solution. A forward stepwise discriminant analysis revealed the subset of three variables that met the criterion level (via Wilks' lambda) necessary for inclusion in the model.

The linear discriminant analysis produced one function that was statistically significant beyond the .01 level. (F between group 1 {no correct cigarette matches} and group 2 {one correct cigarette match} = 14.546; d.f. = 3, 78; $p < .01$. F between group 2 {one correct cigarette match} and group 3 {two correct cigarette matches} = 6.9077; d.f. = 3, 78; $p < .01$. F between group 1 {no correct cigarette matches} and group 3 {two correct cigarette matches} = 25.152; d.f. = 3, 78; $p < .01$.) The function is composed of three predictor variables of ability to match cigarette brand advertising symbols with the cigarette product category. Each variable made a statistically significant ($p < .01$) contribution to the function's discriminant ability.

The predictor variables and their classification function coefficients, listed in order of their relative contribution to the overall solution, are overall matching score (.51206), cognitive developmental score (.47424), and gender (.45939). Age did not meet the criterion level necessary for inclusion in the model. Table 6 reports predictor variables and their coefficients.

When the resulting discriminant function was ap-

Table 6
Predictors of Recognition of Cigarette Brand Symbols
(N = 83)

Predictor Variables	Standardized Canonical Discriminant Function Coefficients		
Summary score for overall identification of brand advertising symbols	.51206		
Cognitive developmental Score	.47424		
Gender	.45939		
Comparisons Between Discriminant Groups	F	d.f.	p
Group 1 (0 correct) vs. group 2 (1 correct)	14.546	3,78	<.01
Group 2 (1 correct) vs. group 3 (2 correct)	6.9077	3,78	<.01
Group 1 (0 correct) vs. group 3 (2 correct)	25.152	3,78	<.01

plied to the dataset to test its classification power, the overall figure for correct classification was 71%, which may be somewhat inflated because the same subjects were used for both classifying observations and calculating the predictive function (Klecka 1980). Eighty-five percent of group 1, 64% of group 2, and 74% of group 3 were correctly classified by the model.

The discriminant analysis thus revealed that children's ability to match cigarette brand trademarks or trade characters to the correct product category is related to their overall ability to match brands to product categories, their cognitive developmental level, and their gender. Therefore, cognitive developmental level, and not age, is a predictor of overall recognition of cigarette brand advertising symbols.

Affect for Cigarettes

For a subset of six product categories, the children were asked whether they liked the product or disliked the product. Ninety-six percent of the children reported that they disliked cigarettes. Therefore, af-

fect is unrelated to age, cognitive level, recognition score, or target market identification score.

Perceptions of the Value of Cigarettes

Asked whether cigarettes were "good for you" or "bad for you," 97% of the children reported that cigarettes are "bad for you." Lack of variability resulted in no correlations between the evaluation measure and age, cognitive level, recognition score, or target market identification score.

Identification of Appropriate Target Market for Cigarettes

The children were asked to identify the appropriate target market for cigarettes and five other product categories. None of them reported that cigarettes are appropriate for children. A majority (70%) reported that cigarettes are for adults; 27% volunteered the response that cigarettes are appropriate for "nobody."

Table 7
Identification of Target Market for Cigarettes by Age

Identified as Appropriate Target Market for Cigarettes	Age Group		
	Under 6 (41-72 Months) (n=28) %	6-7 (73-87 Months) (n=27) %	Over 7 (88-103 Months) (n=28) %
Nobody	18	33	29
Adults	75	67	68
Both adults and children	3	0	0
No answer/don't know	3	0	3

Chi-square test on frequencies: $\chi^2 = 4.41$, d.f. = 6, $p = n.s.$

Table 8
**Identification of Target Market for Cigarettes by
Recognition of Cigarette Brand Symbols**

Identified as the Appropriate Target Market for Cigarettes	Summary Score of Identification of Cigarette Brand Symbols		
	0 (n=20) %	1 (n=44) %	2 (n=19) %
Nobody	40	21	26
Adults	55	75	74
Both adults and children	0	2	0
No answer/don't know	5	2	0

Chi-square test on frequencies: $\chi^2 = 4.73$, d.f. = 6, $p = n.s.$

Only one of the 83 children interviewed responded that cigarettes are for both children and adults.

Chi-square analyses were conducted to determine whether the ability to identify the target market for cigarettes is related to age or to recognition of cigarette brand symbols. The ability to identify adults as the appropriate target market for cigarettes is unrelated to age ($\chi^2 = 4.41$, d.f. = 6, $p = n.s.$). Children in every age category identified adults with greatest frequency as the appropriate target market for cigarettes. Table 7 reports cigarette target market identification by age.

Recognition of cigarette brand symbols—specifically Joe Camel or the Marlboro “red roof”—is unrelated to the ability to identify adults as the appropriate target market for cigarettes. (χ^2 for identification of cigarette target audience by summary score for cigarette brand matching = 4.73, d.f. = 6, $p = n.s.$). Table 8 reports the findings for cigarette target markets by overall recognition of cigarette brand symbols.

There is no relationship between recognition of specific cigarette brand symbols and ability to identify adults as the appropriate market for cigarettes. Children who correctly matched the Joe Camel trade char-

Table 9
Identification of Target Market for Cigarettes
by Recognition of Joe Camel and Marlboro "Red Roof"

Identified as Appropriate Target Market for Cigarettes	Correctly Identified Joe Camel (n=61) %	Correctly Identified Marlboro Symbol (n=22) %
Nobody	23	23
Adults	74	77
Both adults and children	2	0
No answer/don't know	2	0
Chi-square Test on Frequencies		
χ^2	2.54	1.48
d.f.	3	3
p	n.s.	n.s.

acter did not differ from others in their identification of the target market for cigarettes ($\chi^2 = 2.54$, d.f. = 3, $p = \text{n.s.}$). Similarly, children who recognized the Marlboro "red roof" did not differ from others in their identification of the target market for cigarettes ($\chi^2 = 1.48$, d.f. = 3, $p = \text{n.s.}$). Table 9 reports findings for identification of cigarette target markets by recognition of Joe Camel and by recognition of the Marlboro "red roof."

Summary of Findings for Target Market Identification. Neither age nor awareness of the advertised cigarette brands had any impact on judgments of whether cigarettes were appropriate products for children to consume. Regardless of their age or their familiarity with the specific cigarette brand symbols, children reported themselves to be an inappropriate target market for consumption of cigarettes. Table 10 summarizes findings for the two research questions.

Discussion and Implications

Children, Social Science, and Policymaking

The study findings suggest that, for young children, recognition of brand advertising symbols does not necessarily result in positive affect for a product category or in belief in the appropriateness of the products for children. Specifically, the findings con-

firm the results of previous studies showing high awareness of Joe Camel, which increases with age, among young children. From 54% to 86% of children three to eight years of age correctly matched Joe Camel to a picture of a cigarette.

The increase in ability to recognize Joe Camel should be viewed within the broader context, however. Overall recognition of more than 20 other brand advertising symbols also increases with age among children in the study, and the awareness extends to a wide range of children's and adults' products. These findings are not surprising when one considers the growth in cognitive development and the enhancement of attention skills and memory capacity that occur among children from three to eight years of age. The increase in the ability to recognize Joe Camel is only a fraction of the total increase in awareness of external environmental stimuli among developing children.

To equate high awareness with positive attitudes or the intent to consume the product may underestimate the abilities of young children to think critically, engage in perspective-taking, and make value judgments. Children in the study, regardless of their recognition of Joe Camel, indicated that they dislike cigarettes, believe cigarettes are "bad for you," and find cigarettes to be inappropriate for children.

The implications of these findings are twofold. First, to gain insights about children and their capabilities, researchers must not view children as unidimensional,

Table 10
Findings Related to Research Questions

Question	Analysis	Table Number	Finding
1. How is age related to:			
• awareness of brand advertising symbols	Discriminant analysis	5	Not a predictor
	Dependent variable = ability to identify cigarette brand advertising symbols		Age did not meet the criterion level necessary for inclusion in the model
• ability to identify adults as the appropriate target market for cigarettes	No variability among responses; therefore no analysis conducted		
2. How is cognitive developmental level related to:			
• awareness of brand advertising symbols	Discriminant analysis	5	Cognitive developmental level is a significant predictor of recognition of cigarette brand advertising symbols
	Dependent variable = ability to identify cigarette brand advertising symbols		
• ability to identify adults as the appropriate target market for cigarettes	No variability among responses; therefore no analysis conducted		

but must design studies that recognize the complex nature of the developing child. Second, when social science research is used to guide policy decisions, researchers must accept the additional responsibility of interpreting and identifying the implications of their findings with precision.

Cognitive Development

The findings have implications for the cognitive development of young children. Although previous research suggests a high understanding of the appropriate target market among three-year-olds, the uniformity of response in the study was somewhat unex-

pected. Specifically, because recognition of Joe Camel is a function of a lower-level skill of memory capacity, one would expect recognition scores to increase with age and cognitive development as they did in the study. However, standard interpretation of Piagetian theory would suggest that unlike recognition, identification of the target audience—which is a function of the higher-level skill of perspective-taking—would be low for younger (pre-operational) children and high for older (concrete operational) children. Although previous studies have found that younger children demonstrate some perspective-taking skills when a nonverbal measure is used, the uniformly high scores achieved by even the youngest children in the study

were somewhat unexpected. Virtually all the children, regardless of age or cognitive development, indicated that children are not an appropriate target market for cigarettes.

Several alternative explanations can be offered for the findings: (1) ability to empathize may develop prior to other concrete operational abilities, (2) the nonverbal method might allow measurement of the ability at an earlier age than standard Piagetian tests, or (3) the identification score may be a measure of attention and memory rather than perspective-taking. The last suggestion implies that children are simply "parroting," repeating what they have heard without making genuine inferences on their own (Bryant 1974; Smedslund 1963).

Young children can be effective supporters of public awareness campaigns. Some mothers refer to their offspring as the environmental police who admonish household members to "reduce, reuse, recycle," to turn off lights and appliances to save energy, and to take shorter showers to conserve water. There is a very low probability that children will encounter individuals who advise them *not* to reduce, reuse, and recycle, who advocate pollution as a sound practice, or who encourage them to waste resources. Reinforcement of the same message from several sources would facilitate low-level memorization and playback of the messages.

Although memory may play a major role in facilitating a child's recitation of a public awareness campaign script, the Joe Camel campaign is different in a significant way: because of the controversy surrounding Joe Camel, conflicting perspectives are presented. The cigarette manufacturers suggest that cool dudes smoke, whereas a public awareness campaign that reaches schools, parents, and mass media teaches children that drugs are for losers and that cigarettes are drugs. How is a developing child to resolve the dissonant cognitions?

The Role of Environmental Challenge. External environmental variables appear to facilitate the acquisition and demonstration of skills during the transition from the pre-operational to the concrete operational stage. Piagetian theory holds that a child whose biological structures are ready to perform concrete operations can do so only when the appropriate challenges are encountered in the external environment. Children from households in higher socioeconomic levels enter the concrete operational stage at a younger biological age than others, in part because they encounter a more varied environment that provides the situations necessary to complete the shift to concrete

operations (Bryant 1974; Klahr and Wallace 1976).

The public debate over smoking and cigarettes, which presents at least two opposing viewpoints, may constitute a significant developmental opportunity for children who are making the transition to the stage of concrete operations. Forming an opinion about the controversy—choosing sides—requires the ability to empathize, engage in perspective-taking, and make value judgments. Some researchers conclude that cigarette advertising may pose an important health risk for children. On the contrary, characters such as Joe Camel, by attracting the attention of young children, may make the product category and the surrounding controversy more salient and thereby facilitate the acquisition of perspective-taking skills and increase understanding of the health risks associated with smoking.

Summary and Conclusions

The study was a preliminary investigation of young children's perceptions of cigarette advertising. Findings should be interpreted within the limited scope of the study, which sought to determine how recognition of brand advertising symbols is related to attitudes toward advertised products among children three to eight years of age.

Previously, researchers have assumed a link between young children's high awareness of cigarette brand logos and intention to smoke. The study reported here examined the processes that intervene between stimulus recognition and actual behavior and assessed the relationship between children's recognition of cigarette brand advertising symbols and their affect toward cigarettes, evaluation of cigarettes, and ability to understand that cigarettes and cigarette ads are intended for adult consumption. It also investigated how age and cognitive development are related to perceptual variables.

Interviews were conducted with children to determine their relative cognitive developmental level and their ability to match brand advertising symbols to the correct product category. The children were also asked a series of questions to assess their attitudes toward the advertised products. As expected, a significant positive relationship was found between age and recognition of cigarette brand advertising symbols, and of Joe Camel specifically. As in previous studies, recognition of Joe Camel was relatively high. However, the children were also able to match a large number of adult brand symbols to the correct product category at rates equal to or higher than the recogni-

tion rates for Joe Camel. The significant positive relationship between age and overall recognition of brand advertising symbols in general for 22 adults' and children's products is not surprising in light of the increases in memory capacity and cognitive skills that occur between the ages of three and eight.

Somewhat more surprising are the findings on children's attitudes toward cigarettes. Regardless of age, cognitive developmental level, or recognition of Joe Camel, virtually all the children reported that they dislike cigarettes and believe cigarettes are "bad for you." None reported that cigarettes are appropriate for children, and 27% volunteered that cigarettes are in fact appropriate for "nobody."

The study demonstrates that high awareness of brand advertising symbols among young children is not necessarily linked to positive attitudes toward or intent to use the advertised product. As a cross-sectional investigation, the study did not examine the cumulative impact of exposure to product-related information from parents, teachers, siblings, peers, or the mass media over time, nor do the findings support inferences about age or cognitive development as causal factors in creating perceptions of advertising. The study is also limited in its generalizability; the sample consisted of children from middle-class households in a rural school district. Children from inner-city schools or from lower socioeconomic backgrounds may have different perceptions or levels of awareness. Hence, the study provides a narrowly focused "snapshot" of the variables that intervene between stimulus recognition and behavior, at a single point in time, for a convenience sample of young children.

The study did not measure the potential impact of several sources of influence on children's perceptions of cigarette advertising. Future research could assess whether the child lives in a smoking or a nonsmoking household, the extent to which teachers, parents, siblings, peers, or television role models are perceived to have positive or negative attitudes toward smoking, perceptions of antismoking public service announcements and promotional materials, and the role of cigarette advertising in facilitating an understanding of the health risks associated with smoking. Collection of those types of covariate data would enable the researcher to assess the effects of other sources of influence on children's perceptions, thus enhancing understanding of the relationship between awareness and behavior.

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