

Children's Understanding of TV Advertising: Effects of Age, Gender and Parental Influence

Tammo H.A. Bijmolt'

Wilma Claassen

Both: Tilburg University, Department of Business Administration,
PO Box 90 153,5000 LE, Tilburg, The Netherlands,
phone: +3 1-13-4663423, fax:+3 1-13-4662875, e-mail: t.h.a.bijmolt@kub.nl

Britta Brus

WEMAR Market Research.
Westerkade 4, 30 16 CL. Rotterdam, The Netherlands,
phone: +3 1-10-3361500, fax +3 1-10-4361715

' The authors would like to thank Jaideep Prabhu for helpful comments on earlier drafts of this paper.

Children's Understanding of TV Advertising: Effects of Age, Gender and Parental Influence

ABSTRACT

We investigate children's understanding of TV advertising, that is their ability to distinguish between TV programs and commercials and their comprehension of advertising intent, using verbal and non-verbal measurements. The sample consists of 153 children, ranging from 5 to 8 years old, and their parents. Results using non-verbal measures suggest that most children are able to distinguish commercials from programs and that they have some insight into advertising intent. Results using verbal measures, however, are not as conclusive; the percentage of children who show understanding of TV advertising is substantially lower. Effects of age, gender, and parental influence are assessed using MURALS, a regression analysis method for categorical and continuous variables, and CHAID, an analysis method to detect homogeneous segments on the basis of the relation between categorical dependent and explanatory variables. The age of a child turns out to have a positive effect. The effects of gender and parent-child interaction are rather small, both for verbal as for non-verbal measures of understanding of TV advertising. A high level of parental control of TV viewing may result in lower understanding of TV advertising.

INTRODUCTION

From a child's point of view, what is the purpose of TV advertising? Is advertising on TV done to give actors the opportunity to take a rest or practice their lines? Or is it done to make people buy things? Furthermore, is the main difference between programs and commercials that commercials are for real, whereas programs are not, or that programs are for kids and commercials for adults? As has been shown several times in the literature (e.g. Butter et al. 1981; Donohue, Henke, and Donohue 1980; Macklin 1983 and 1987; Robertson and Rossiter 1974; Stephens and Stutts 1982), some children are able to distinguish between programs and commercials and are aware of the intent of TV advertising, whereas others are not.

There is a general concern of parents and other societal actors, that TV advertising may have a negative, intended or unintended, influence on children (Burr and Burr 1977; Goldberg 1990; Goldberg and Gom 1978; Grossbart and Crosby 1984). Specifically, TV advertising may lead a child to select material objects over more socially oriented alternatives, potentially increase parent-child conflict and may lead to a more disappointed, unhappier child (Goldberg and Gom 1978). One of the reasons behind this parental concern is that children can be exploited more easily if they do not understand the differences between television programming and commercials and if they do not **know** the selling intent of commercials. If children understand the intention of commercials and are able to distinguish them from programs, however, the potential effect of advertising might be reduced. First, understanding of TV advertising allows children to use cognitive defences, such as producing counter arguments (Brucks, Armstrong, and Goldberg 1988). Second, the recognition of the difference between programs and commercials, allows them to avoid or break of commercials by zapping to another channel, as it has been shown that children zap at least as much as adults do (Heeter and Greenberg 1985: **Zufryden** Pedrick, and Sankaralingam 1993). Hence, whether or not children have an understanding of TV advertising is an important issue to investigate, both from the parents standpoint as understanding may prevent negative influences on the well-being of their children, and from the advertisers standpoint as it will alter the effectiveness of their TV commercials.

In this paper, we assess children's understanding of TV advertising, as decomposed into their recognition of the difference between programs and commercials and their comprehension of the selling intent of commercials. Verbal and non-verbal measurements of both components are obtained from a sample of 153 children in the age of 5 to 8 years. We investigate whether age, gender, and parental influence have an effect on these measures of understanding of TV advertising. Thus, the contribution made by this paper is threefold. First, we obtain and compare verbal and non-verbal measures for two components of understanding TV advertising: the recognition of the difference between programs and commercials and the comprehension of advertising intent. Second, this study replicates and strengthens previous research into the extent to which children have an understanding of TV advertising and the effects of age, gender, parent-child interaction, and parental control on this understanding. Finally, we demonstrate the application of two relatively new analysis methods, namely MURALS and CHAID, that can be used in research involving categorical variables.

The rest of this paper is as follows. First, background literature is discussed and hypotheses are formulated. Then, the design of study and the analyses are described. Next, the results of our analyses are presented. Finally, implications of these results are discussed.

BACKGROUND

Two components of understanding of TV advertising

Children's understanding of TV advertising can be decomposed into: 1) their ability to distinguish between programs and commercials and 2) their ability to comprehend the selling intent of advertising. To some extent, these two components are related in a hierarchical manner, as comprehension of the selling intent of advertising implies that one is aware of a certain difference between commercials and programs, whereas the opposite does not necessarily hold. It has been shown that most children aged between 5 and 8 years can discriminate between programs and commercials and/or comprehend the purpose of the commercials (e.g. Butter et al. 1981; Stephens and Stutts 1982). Thus, the following hypothesis can be stated:

H1. Most children, aged 5 to 8 years, have some understanding of TV advertising.

Verbal and non-verbal measures

Understanding of TV advertising has been measured by verbal methods and/or by non-verbal methods. In research using verbal methods, the child is typically asked to verbalize an answer to questions like “What is the purpose of TV commercials?” or “What according to you is the difference between a program and a commercial?” Such verbal methods are used by Butter et al. (1981) among others. In research using non-verbal methods, the child provides his/her answer by selecting a photograph or a drawing, or even by acting out the answer (see Macklin 1987). In both cases, verbal or non-verbal responses are typically obtained during a personal interview conducted after the child has watched TV. Alternatively, these measures are collected while the child is watching TV. Such a simultaneous verbal method is used by Butter et al. (1981) and a simultaneous non-verbal method is used by Stephens and Stutts (1982).

Macklin (1983, 1987) provided an overview of the (dis-)advantages of the various tasks to be used for measuring a child’s understanding of TV advertising. She argued that non-verbal tasks are more appropriate for use with young children who are linguistically limited and that such methods should be used to assess children’s abilities in a commercial context. In the Butter et al. (1981) study, 80 percent of a group of children, with an age of about 5 years, correctly identified four out of four commercials. If these children were asked to verbalize the purpose of advertising on TV, however, 90 percent of them failed. Furthermore, in non-verbal tasks, preschoolers may respond only based on perceptual cues and do not truly understand the difference between programs and commercials required for verbal tasks (Stephens and Stutts 1982). Therefore, we formulate the following hypothesis stating a difference between verbal and non-verbal measurements:

H2. In comparison with verbal measurement methods, using non-verbal measurement methods will result in a higher percentage of children understanding TV advertising.

Age

The prevailing candidate for explaining age differences in children’s reactions to television

advertising has been Piaget's theory of cognitive development. According to this view age differences are explained in terms of four stages. Each stage is characterized by the cognitive structures the child uses in perceiving and handling information from the environment. The two stages relevant for this study are: the preoperational thought stage (2-7 years) and the concrete operations stage (7-11 years). The preoperational thought stage is characterized by the development of language and rapid conceptual development. During the following stage, that is the concrete operations stage, the child develops the ability to apply logical thought to concrete problems. Alternatively, one could adopt the information-processing framework and the central-incident learning paradigm as suggested by Roedder (1981). She characterized the development of children in terms of their processing abilities and categorised them into three stages. Strategic processors (age 11 years and older) are able to use information storage and retrieval strategies spontaneously, cued processors (age 7 to 10) are able to use such strategies only if cues are provided, and limited processors (age 6 and below) ~~can~~ not use these processing strategies. Hence, both theoretical frameworks are not in contrast with one another, but point in the same direction: a positive effect of age on understanding of TV advertising. Furthermore, it has been shown a number of times in the literature that the age of a child is one of the best, if not the best, explanatory variables for the child's understanding of TV advertising (e.g. Butter et al. 1981; Macklin 1987; Rossiter 1979; Stephens and Stutts 1982; Stutts, Vance, and Hudleson 1981). Thus from theory and from previous research, one would expect children's understanding of the nature and purpose of TV commercials increases dramatically with age. Therefore, we state the following hypothesis on the effect of age:

H3. *The age of a child has a positive effect on the child's understanding of TV advertising.*

Gender

Boys and girls differ on a number of things. such as information processing styles (see e.g. Hendon, McGann and Hendon 1978). Most studies published in the literature, however, have not found significant differences between boys and girls with respect to their ability to distinguish programs and commercials or their comprehension of the selling intent of TV commercials (e.g. Butter et al. 1981; Macklin 1987). Thus:

H4. The gender of a child does not have an effect on the child's understanding of TV advertising.

Parental influence

Parents are generally concerned about the (social) well-being of their children. This well-being, from the parental point of view, might be adversely affected by marketing effort directed at their children (see e.g. Burr and Burr 1977; Carlson, Grossbart, and Walsh 1990). In particular, TV advertising on food causes parental concern (Grossbart and Crosby 1984). In response, parents may try to mediate and control their children's TV viewing and/or discuss advertising content and intent with their children. Parental control of TV viewing is expected to lower the number of hours a child watches TV and thereby the cumulative experience a child has with TV advertising, which in turn might have a negative effect on the child's understanding of TV advertising. This way, as intended by the parents, control of TV viewing may lower the total effect of TV advertising on the child, but it may also have the opposite effect. Frequent parent-child interaction on TV advertising will most likely not have an effect on the number of hours a child watches TV, but it may have a positive effect on a child's understanding of TV advertising. Evidence of the effectiveness of these attempts to lower the total influence of TV advertising on the child is somewhat mixed, but most studies find no or rather small effects of parental concern (see Grossbart and Crosby 1984; Reid 1979; Stephens and Stutts 1982; Wiman 1983). Therefore, we formulate the following hypotheses stating no effect of both components of parental influence:

H5. The frequency of parent-child interaction on the TV advertising does not have an effect on a child's understanding of TV advertising.

H6. Parental control of TV viewing does not have an effect on a child's understanding of TV advertising.

RESEARCH DESIGN

In order to assess children's understanding of TV advertising and the factors affecting it, we conducted a study in an experimental setting. First, three pilot studies with three children each were conducted to select a suitable product category, brand, and commercial as well as to test experimental procedures and measurements.

Selection of product and commercial

The product category of chocolate drinks was selected, because it was considered attractive for both boys and girls. Next, a brand was selected which is familiar to most children and was marketed from year to year in a variety of contexts. The TV commercial used in this study was in colour and had a duration of 60 seconds, which is somewhat longer than average but not uncommon in The Netherlands (Pieters and Bijmolt 1997). The commercial contained several attractive elements for children (e.g. humour) and was new to them, since the commercial had not been broadcasted yet. It showed a male preschooler making several requests to his mother, at the end of which he says he is only joking as long as she buys him the target brand.

Sample

The sample consisted of 153 elementary school children and their parents living in medium-sized cities in The Netherlands. The children were from two elementary schools in predominantly white, middle and upper class neighborhoods. Fifty-six percent of the child respondents were boys; forty-four percent were girls. Their ages ranged from five to eight years old.

The parents of the children were contacted and interviewed by phone two days after the interview with their child. All parents could be reached by phone. Seven parents refused to cooperate in the research project, however, yielding 146 complete sets of child and parent data. Mothers and fathers constituted eighty-five and fifteen percent of the sample respectively.

Procedure

Children were taken from their class in random groups of three to a child-friendly room in the school. To put the children at ease, the woman who performed this liaison function spent some time prior to the experiment at each school getting becoming acquainted with the children. The children were told that they would watch a TV program. Next, they were taken

to a room where they were seated on the floor in front of a TV screen. They were offered something to drink and a cookie and two additional female interviewers were introduced to the children. All interviewers received special instructions about research with children prior to the experiment. The three children then watched a ten-minute program (a story about a witch) appropriate for children from the age of five to eight. This program contained a natural break in which the target commercial was shown. Directly after watching the TV program, the children were interviewed individually. Finally, the interviewer thanked the children and returned them to the class room. To minimize bias, the children were asked not to talk about the experiment with their classmates.

Measures

The understanding of TV advertising by children was measured by using a verbal method and a non-verbal method.

To measure whether children recognise the difference between the TV program and the commercial in a non-verbal way, a measurement technique used by Stephens and Stuttz (1982) was adopted. In this non-verbal task, the children are told they are going to watch TV. They are asked to keep their hands in their lap during a program and to put their hand on a red square of cardboard, which is placed in front of each child, during a commercial. To prevent them from copying the actions of others, the children are separated by a screen so that no child can see the movements of the other two children in the room. Each child's hand movements are recorded during the treatment period, indicating whether or not the child correctly or incorrectly distinguishes the transitions between program and commercial. Before the children watch the program, the interviewer plays a warm-up game with each child separately to get them used to the proper method of response. In the warm-up game children are shown large display cards that pictured either a toy or something to eat. They are told to keep their hands on the red square when they see a picture of something to eat. When they see a toy, they are to take their hands back in their laps. The warm-up game is played until each child can play the **game**.

To measure whether children comprehend the selling intent of TV commercials in a non-verbal way, the technique used by Donohue, Henke, and Donohue (1980) was adopted. In this non-verbal task, each child is confronted with three pictures. The child is asked: "What does the boy in the commercial want **you** to do?" The child then has to choose one of the pictures

to answer the question. The most correct answer is a picture showing a mother and a child buying the target brand of chocolate drink. The second best picture shows shelves in a shop with the chocolate drink. The incorrect answer is a picture showing two children watching the target commercial on TV.

After these non-verbal measures, the children were asked two questions. The verbal measure of whether a child recognises the difference between the program and the commercial was formulated as follows: “What is the difference between the story with the witch and the story with the boy?”. The verbal measure of whether a child comprehends the selling intent of TV commercials was formulated as follows: “Can you tell me what is the purpose of advertising on TV, for example in the commercial with the boy? Why do they show advertising on TV?”. Visual stimuli or cues may increase the ability of children aged 5 to 8 year to retrieve information substantially (Macklin 1994; Roedder 1981). Therefore, to support both verbal questions, two pictures were shown, one with a key situation from the program and one with a key situation from the commercial. After all interviews were done, the answers to both questions were divided into three different categories: correct and important, correct but unimportant, and incorrect, which yields two ordinal, verbal measures of understanding of TV advertising.

Parental influence was measured using two sets of items developed by Wiman (1983): the parent-child interaction scale and the parental control of TV viewing scale. The parent-child interaction scale consists of a list of eight situations representing verbal interactions specifically concerning TV advertising (e.g. While watching television with your child, you discussed some commercial you had both just seen.). For each item the parent is asked how many times, if any, the situation has occurred during the past month. There is also a ninth (open-ended) item which allows the parent to indicate any other interaction of this nature not included in the previous eight. but very few respondents utilized this item. To measure parental control of TV viewing ten statements were formulated by Wiman (1983). These items describe various means of exercising or avoiding control over the child’s television viewing (e.g. I let my child decide which particular TV shows to watch.). A 4-point rating scale, labelled ‘all of the time’, ‘most of the time’, ‘some times’, and ‘never’, was provided to the parents to use for answering these ten questions.

To check whether the items indeed form the two scales intended, Cronbach’s alpha was

computed for both sets. These alpha's turned out to be satisfactorily high, namely 0.78 for the parent-child interaction scale and 0.72 for the parental control scale. Therefore, the total number of interactions specified across all situations can be used as the parent-child interaction measure, and the sum score of the 10 control items is used as the parental control measure. To facilitate a more insightful interpretation, we recoded each of the scales into three about equally large categories (low, medium, large).

ANALYSIS

First, frequencies were calculated for the four measures of children's understanding of TV advertising, each coded into three ordinal levels. Next, four MURALS analyses (Van der Kooij and Meulman 1996) were performed to assess the effects of age, gender, parent-child interaction, and parental control of TV viewing: one for each measure of understanding of TV advertising. MURALS is a program for multiple regression in which (some of) the independent and/or the dependent variables are categorical (nominal or ordinal) instead of, as usually assumed, continuous. In the algorithm, category quantifications are estimated for these nominal or ordinal variables. Next, by means of these category quantifications the variables are entered in an ordinary multiple regression analysis. The final outcome of MURALS resembles the outcome of ordinary regression analysis, with the additional feature of category quantifications for the nominal and ordinal variables.

In the four MURALS analyses we performed, the dependent variable corresponds to a child's understanding of TV advertising (incorrect, partly correct, completely correct) and was treated as ordinal. The 'don't know'-category was merged with the 'incorrect'-category in advance. The independent variable age (5, 6, 7 or 8 years) was also treated as ordinal. Since gender (boy, girl) was a dichotomous variable it can be treated as nominal or ordinal yielding the same results. Parent-child interaction (low, medium, high) and parental control of TV viewing (low, medium, high) were treated as nominal instead of ordinal to allow for non-monotonous effects of these variables.

In the MURALS analyses, the four dependent variables were studied separately and only main effects of age, gender, and parental influence were considered. To assess whether there were

significant differences between the four dependent measures (Hypothesis 2), and whether there were significant interactions between these explanatory variables, we additionally performed a Chi-squared Interaction Detection (abbreviated: CHAID) analysis. CHAID analyses have frequently been applied in database marketing and segmentation research, but hardly ever in advertising research. For a more comprehensive explanation of CHAID we refer to Magidson (1993, 1994). In CHAID, a sample is decomposed into segments on the basis of the relation between one categorical dependent variable and a number of categorical explanatory variables. The program first tests whether categories within each explanatory variable can be merged and merges categories that are not significantly different with respect to the dependent variable. Next, it searches for explanatory variables on which the sample can be split significantly. If one or more significant splits can be made, the most significant variable is selected, resulting in two or more segments. This merging of categories and splitting of the sample continues iteratively for each segment that emerges until no significant splits of any segment can be made. The most important part of the CHAID output is a tree diagram showing the pattern of the merging and splitting process. This tree diagram contains the sample size and descriptive statistics for each segment.

In our CHAID analysis, all measures of understanding of TV advertising were treated as independent observations. This yielded a sample size of 584 observations. To allow a more insightful interpretation the understanding measures were recoded as dichotomous variables, where the photo of the shell with the target brand was treated as a correct answer and for the other three variables the middle category was recoded as incorrect. In the CHAID analysis, the measures of understanding were explained by the following variables: age, gender, parental control of TV viewing, parent-child interaction, verbal versus non-verbal measurement, and recognition of program-commercial difference versus comprehension of intent.

RESULTS

[Insert Table 1 about here]

Table 1 presents the percentages of children falling into the various response categories of each measure of understanding of TV advertising. When asked to put their hand on the red

square during a commercial, almost 90 percent of the children recognised both transitions: from program to commercial and from commercial to program. In addition, when asked what the purpose of TV advertising is, 69 percent chose one of the two correct photographs. Almost 47 percent of the children correctly formulated the selling intent of commercials. The correct answer category contains answers like: 'Tries to make people buy things', 'Informs you about products', and 'Shows product you can buy' (Table 2). Nearly all correct, but unimportant responses were 'A commercial is intended as a break during a program'. Many imaginative, but incorrect answers were given, including 'People at the TV show have to take a rest' and 'People at the TV show have to repeat their lines'. A substantial proportion of the group of children, namely 23 percent, were not able or willing to verbalize any reason for advertising on TV. Concerning the fourth and last measure of understanding, only 20 percent of the children were able to verbalize correctly the difference between commercials and programs. These 20 percent provided answers like 'Commercials try to sell things', 'Commercials try to make money', or 'Commercials show things you can buy' (Table 3). The most typical correct but unimportant answer was 'Commercials are shorter than programs'. This answer was given by 22 percent of the children. The incorrect answer category contained responses like 'Programs are fun and commercials are not' and 'Commercials are real and programs are not'. Again a large proportion, for this question almost 38 percent, responded with 'I don't know'. To summarize, hypothesis 1 is confirmed, since nearly all children score positively on at least one measure of understanding of TV advertising, though some measurements are clearly more sensitive than others.

[Insert Tables 2 and 3 about here]

From Table 1 and Figure 1, the latter presenting the tree diagram obtained with CHAID, it becomes clear that the use of verbal versus non-verbal measurement devices is an extremely important factor explaining whether or not a child is judged to understand TV advertising. In the CHAID tree diagram, verbal versus non-verbal is the first factor on which the measures obtained are split into two segments. Using non-verbal measures, 79 percent of the children show some understanding of TV advertising, whereas using verbal measures yields a figure of only 34 percent. This effect is especially large for recognition of the difference between programs and commercials. Almost 90 percent of the children moved their hands correctly

during both transitions, from the program to the commercial and vice versa. Only 20 percent, however, were able to formulate the correct and important difference between the two. Thus, hypothesis 2 is also confirmed; when measuring children's understanding of TV advertising verbal measures yield substantially lower figures as compared to non-verbal measures.

[Insert Figure 1 about here]

The effect of age, gender, parent-child interaction, and parental control is examined for each of the four measures of TV understanding separately with MURALS. The results of these analyses are summarized in Table 4. The verbal measures are better explained than the non-verbal measures as can be seen from the R^2 measures of fit. For the two verbal measures the explained variance is 0.156 and 0.202, both significant at the 0.001-level, whereas for the two non-verbal measures the explained variance is 0.069 and 0.062, with p-values of about 0.05.

[Insert Table 4 about here]

As MURALS estimates category quantifications for each nominal or ordinal variable it is important to examine these for the dependent variables and for the significant explanatory variables. For both verbal measures, the category quantifications are nicely spread indicating a clear difference between the three ordinal levels. For the non-verbal measures, however, the quantifications of the two highest understanding categories are estimated to be the same, indicating no clear ordinal relationship between these levels. For example, the category quantification score on the latent variable is the same for children who recognized only one transitions as the score for those who recognized both transitions. Since, only 7 children recognized none of the transitions. and therefore obtain a score that differs from the others. and the explained variance is not significant (Table 4), we will not further discuss the results of that particular MURALS analysis.

Across the three remaining MURALS analyses, the most prominent effect is that of age. Age has a significant and positive effect on the verbal and non-verbal measures of comprehension of advertising intent and on the verbal measure of recognition of the difference between programs and commercials. For the two verbal methods the category quantifications are

approximately equally spaced, with a somewhat larger step between 6 and 7 years old children. This outcome is confirmed by the CHAID results (Figure I), in which the sample of verbal measures is split into 5 and 6 year old children versus 7 and 8 year old children. Hence, age has a monotonic, almost linear, positive effect on understanding as measured by verbal methods. For the non-verbal measure of comprehension of advertising intent the 5 year olds are isolated from the 6, 7, and 8 year old children all of whom have nearly the same category quantifications. Of the older children, 74 percent are able to indicate a correct photograph showing advertising intent, whereas only 53 of the 4 year old children succeed in this. Hence, hypothesis 3 is confirmed, a child's age generally has a positive effect on understanding of TV advertising.

The effects of gender and parent-child interaction are not significant in any of the four MURALS analyses (see Table 4). In CHAID (Figure I), a split of boys versus girls is made only in the subsample of 5 and 6 years old children when verbal measures are used. This significant difference between boys and girls is mainly due to the fact that 5 and 6 year old girls responded to this particular question much more often with 'I don't know' than boys of the same age did. Nevertheless, we conclude that, in general, the effects of gender (hypothesis 4) and parent-child interaction (hypothesis 5) are negligible.

Parental-control of TV viewing has a (nearly) significant negative effect on the understanding of TV advertising when either the non-verbal measure of comprehension of advertising intent or the verbal measure of recognition of the program-commercial difference is used as dependent variable. Its effect on the non-verbal measure of recognition of the program-commercial difference is significant too, though this outcome is rather unreliable and therefore ignored for reasons mentioned earlier. The quantification scores of parental control, in the two MURALS analysis where it has a significant negative effect, show that the difference between the high and the medium control group is more pronounced than that between the medium and **low** control group. Parental control of TV viewing has a significant effect on the non-verbal measure of comprehension of advertising intent as well as on the verbal measure of recognition of program-commercial differences. Children who encounter a relatively high control of TV viewing by their parents score lower on understanding of TV advertising as compared to those who encounter medium or low parental control. Thus, results

for hypothesis 6 are mixed, and it has to be at least partly rejected.

DISCUSSION

This study replicates and extends findings previously published in the literature. We find that the child's age has a substantial positive effect on the child's understanding of TV advertising. This effect is more pronounced for the results using verbal measures than those using non-verbal measures. Furthermore, gender and parent-child interaction on TV advertising have very little to no impact on the child's understanding of TV advertising. The only difference observed between boys and girls in this respect is that in some cases girls responded more often than boys with 'I don't know'. Contrary, to several previous studies (e.g. Wiman 1983), we find a small but significant negative effect of parental control of TV viewing. A high control of TV viewing may result in a relatively low understanding of TV advertising. Thus, parental control may have unintended negative side effects.

The use of non-verbal methods to measure children's understanding of TV advertising has been advocated by Macklin (1987) among others. Arguments for this standpoint are that young children, say below six years of age, have difficulties formulating verbal answers (Macklin 1987) and that they are limited processors not able to use information storage and retrieval strategies (Macklin 1994; Roedder 1981). The results of this study support this view, since younger children scored significantly lower than the older children on verbal measures, whereas age has less effect on the non-verbal measures. On the other hand, the verbal measures were explained better than the non-verbal measures by the factors considered in this study. Furthermore, young children may base their non-verbal responses merely on perceptual cues such as the length of the story (Stephens and Stutts 1982) or jingles or other separators between programs and commercials (Stutts, Vance, and Hudleson 1981) without really understanding the purpose of advertising. Hence, if a researcher explicitly wants to study factors affecting understanding of TV advertising, verbal methods might be more effective in identifying differences between children and therefore preferable. If the purpose is to have a measure which is more sensitive to rather low levels of understanding, the non-verbal methods might be more appropriate.

In this paper, we demonstrate how two relatively new research methods MURALS and CHAID, which are specifically developed to analyze categorical data, can be applied in the field of advertising research. The program MURALS allows a researcher to perform regression analysis on categorical variables, whereas regression analysis traditionally requires continuous variables. In our study, the MURALS results provide excellent insights into the relationship between the categories within a certain variable (e.g. the various age categories) as well as into the relation between one dependent variable (here understanding of TV advertising) and a number of explanatory variables. The method CHAID is complementary to this it aims at discovering interaction effects between categorical variables by splitting the sample into a number of homogeneous segments. In our study, the results of CHAID indeed resemble those of MURALS and in addition show an interaction effect between age and gender. Finally, CHAID is available in the standard statistical package SPSS for Windows, and MURALS will most probably be available in a similar standard statistical package in the near future. Given that categorical data are frequently encountered in advertising research, both methods could be fruitfully applied in the future.

Future research may focus on understanding of TV advertising as a cause instead of as an effect. For example, does recognition of the difference between programs and commercials have an impact on children's TV watching behavior like zapping to another channel when a commercial break starts? Furthermore, in cross sectional studies the effect of age is confounded with the effect of birth cohorts. Thus ideally one would collect longitudinal data on the development of individual children and their understanding of TV advertising.

REFERENCES

- Brucks, Merrie, Gary M. Armstrong, and Marvin E. Goldberg (1988), "Children's Use of Cognitive Defenses Against Television Advertising: A Cognitive Response Approach," *Journal of Consumer Research*, 14 (March), 471-482.
- Burr, Pat L. and Richard M. Burr (1977), "Parental Responses to Child Marketing," *Journal of Advertising Research*, 17 (6), 17-24.
- Butter, Eliot J., Paula M. Popovich, Robert H. Stackhouse, and Roger K. Garner (1981), "Discrimination of Television Programs and Commercials by Preschool Children," *Journal of Advertising Research*, 21(2), 53-56.
- Carlson, Les, Sanford Grossbart, and Ann Walsh (1990), "Mothers' Communication Orientation and Consumer-Socialization Tendencies," *Journal of Advertising*, 19 (3), 27-38.
- Donohue, Thomas R., Lucy L. Henke, and William A. Donohue (1980), "Do Kids Know What TV Commercials Intend?," *Journal of Advertising Research*, 20 (5), 51-57.
- Goldberg, Marvin E. (1990), "A Quasi-Experiment Assessing the Effectiveness of TV Advertising Directed to Children," *Journal of Marketing Research*, 27 (November), 445-454.
- Goldberg, Marvin E. and Gerald J. Gom (1978), "Some Unintended Consequences of TV Advertising to Children," *Journal of Consumer Research*, 5 (June), 22-29.
- Grossbart, Sanford L. and Lawrence A. Crosby (1984), "Understanding the Bases of Parental Concern and Reaction to Children's Food Advertising," *Journal of Marketing*, 48 (Summer), 79-92.
- Heeter, Carrie and Bradley S. Greenberg (1985), "Profiling of Zappers," *Journal of Advertising Research*, Vol. 25 (April/May), 15-19.
- Hendon, Donald W., Anthony F. McGann and Brenda L. Hendon (1978). "Children's Age, Intelligence and Sex as Variables; Mediating Reactions to TV Commercials: Repetition and Content Complexity, Implications for Advertisers," *Journal of Advertising*, 7 (3), 4-12.
- Macklin, Carole M. (1983), "Do Children Understand TV Ads?," *Journal of Advertising Research*, 23 (1), 63-70.
- Macklin, Carole M. (1987), "Preschoolers' Understanding of the Informational Function of

- Television Advertising,” *Journal of Consumer Research*, 14 (September), 229-239.
- Macklin, Carole M. (1994), “The Impact of Audiovisual Information on Children’s Product-related Recall,” *Journal of Consumer Research*, 21 (June), 154- 164.
- Magidson, Jay (1993), *SPSS for Windows CHAID Release 6.0*. Chicago: Statistical Innovations Inc.
- Magidson, Jay (1994), The CHAID Approach to Segmentation Modeling: Chi-squared Automatic Interaction Detection. In: *Advanced Methods of Marketing Research*, Richard P. Bagozzi, ed., Cambridge: Blackwell Publishers, 118-159.
- Pieters, Rik G.M. and Tarn. H.A. Bijmolt (1997), Consumer Memory for Television Advertising: A Field Study of Duration, Serial Position, and Competition Effects,” *Journal of Consumer Research*, 23 (March), 362-372.
- Reid, Leonard N. (1979), “The Impact of Family Group Interaction on Children’s Understanding of Television Advertising”, *Journal of Advertising*, 8 (Summer), 13-19,
- Robertson, Thomas and John R. Rossiter (1974), “Children and Commercial Persuasion: An Attribution Theory Analysis,” *Journal of Consumer Research*, 1 (June), 13-20.
- Roedder, Deborah L. (1981), “Age Differences in Children’s Responses to Television Advertising: An Information-Processing Approach,” *Journal of Consumer Research*, 8 (September), 144-153.
- Rossiter, John R. (1979), “Does TV-Advertising Affect Children?,” *Journal of Advertising Research*, 19 (February), 49-53.
- Stephens, Nancy and Mary Ann Stutts (1982), “Preschoolers’ Ability to Distinguish Between Television Programming and Commercials,” *Journal of Advertising*, 11 (2), 16-26.
- Stutts, Mary Ann, Donald Vance, and Sarah Hudleson (1981), “Program-Commercial Separators in Children’s Television: Do They Help a Child Tell the Difference between Bugs Bunny and the Quick Rabbit?,” *Journal of Advertising*, 10 (2), 16-25.
- Van der Kooij, Anita J. and Jacqueline J. Meulman (1996). “*MURALS 0.1: Multiple Regression with Optimal Scoring using Alternating Least Squares*.” Department of Data Theory, University of Leiden, The Netherlands.
- Wiman, Alan R. (1983), “Parental Influence and Children’s Responses to Television Advertising,” *Journal of Advertising Research*, 12 (1), 12- 18.
- Zufryden, Fred S., James H. Pedrick, and Avu Sankaralingam (1993), “Zapping and its Impact on Brand Purchase Behavior,” *Journal of Advertising Research*, 22 (January), 58-66.

Table 1. Children's understanding of TV advertising

Measurement	Response	Percentage
Comprehension of intent (non-verbal)	Mother and kid buying target brand	17.6
	Shell with target brand	51.6
	Kids watching TV	23.5
	Don't know	7.2
Comprehension of intent (verbal)	Correct and important	46.5
	Correct but unimportant	13.1
	Incorrect	17.0
	Don't know	23.5
Difference program-commercial (non-verbal).	Both transitions correct	88.9
	One transition correct	6.5
	None of the transitions correct	4.6
Difference program-commercial (verbal)	Correct and important	20.3
	Correct but unimportant	32.1
	Incorrect	9.8
	Don't know	37.9

**Table 2. Comprehension of advertising intent:
Responses to the verbal measurement**

Responses		Percentages
Correct and important	Tries to make people buy products	26.8
	Informs about products, shows products you can buy	19.7
Correct, but unimportant	Break during the program	11.1
	When the program becomes exciting	1.3
	Others	0.7
Incorrect	People at the show have to rest, change clothes, etc.	6.5
	Commercials are fun	4.6
	Others	5.9
Don't know		23.5

**Table 3. Recognition of commercial-program difference:
Responses to the Verbal measurement**

Verbal responses		Percentages
Correct and important	Commercials try to sell or make money	13.1
	Commercials show things you can buy	4.6
	Programs are entertainment	2.6
Correct but unimportant	Commercials shorter than program	22.2
	Commercials before/during/after program	3.9
	Commercials start with a jingle	3.3
	Others	2.7
Incorrect	Programs are fun, commercials not	2.6
	Commercials are real, programs not	2.0
	Programs for kids, commercials for adults	1.3
	Others	3.9
Don't know		37.9

Table 4. Effects of age, gender and parental influence

Explanatory variables	Dependent variable			
	Comprehension of advertising intent (verbal measurement)	Comprehension of advertising intent (non-verbal measurement)	Recognition of commercial program difference (verbal measurement)	Recognition of commercial program difference (non-verbal measurement)
Age	0.341 (p < 0.001)	0.208 (p = 0.011)	0.407 (p < 0.001)	-0.118 (p = 0.150)
Gender	-0.140 (p = 0.073)	0.048 (p = 0.558)	-0.081 (p = 0.293)	-0.065 (p = 0.428)
Parent-child interaction	0.086 (p = 0.270)	-0.014 (p = 0.863)	0.066 (p = 0.391)	0.115 (p = 0.161)
Parental control	0.086 (p = 0.270)	-0.176 (p = 0.034)	-0.150 (p = 0.051)	0.179 (p = 0.029)
R ²	0.156	0.069	0.202	0.062
P-value; d.f. = 4, 141	6.518 (p < 0.001)	2.611 (p = 0.038)	8.931 (p < 0.001)	2.326 (p = 0.059)