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The impact of children's affective reactions elicited by commercials on attitudes toward the advertisement and the brand

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Abstract

This research investigates the impact of children's affective reactions elicited by TV ads on two essential indicators of advertising effectiveness: the attitude toward the ad (A_{ad}) and post exposure brand attitude (A_{bp}). Working with children as subjects, minimizing forced exposure and using a real program in which real commercials were embedded, were the authors' methodological choices. This offered a setting as naturalistic as possible to assess the impact of verbal as well as non-verbal affective reactions, the latter being measured through facial expressions. It was clearly found that the evaluative judgments of the ad elements of execution — but not of the ad arguments — are instrumental in shaping children's A_{ad} and A_{bp}. Verbal affective reactions, especially the positive ones, are important predictors of A_{ad} and A_{bp}. The link between A_{ad} and A_{bp} is significant both for known and unknown brands. The contribution of facial expressions is limited. A_{ad} does not mediate the impact of affective reactions on A_{bp}. Finally, limitations of this study are pinpointed and issues for further research are offered. © 1997 Elsevier Science B.V.

Keywords: Children; Affective reactions; Facial expressions; Attitude toward the ad; Attitude toward the brand

1. Introduction

Until the end of the 70's, research on the mechanisms of advertising influence on consumers essentially concentrated on the attitude toward the brand (A_b). The uppermost concern was the evaluative confrontation between the benefits the consumer was expecting and the perception he had of the brand's attributes. An advertisement was therefore essentially considered as acting on beliefs relative to brands.

It was not until the beginning of the 80's that a well-founded argument questioned this too rational approach (Mitchell and Olson, 1981; Shimp, 1981). The idea was based on two postulates. On the one hand, a consumer exposed to an ad will develop a specific reaction toward this ad. On the other hand, this particular response will influence the consumers' attitude toward the brand. In the following years, many studies validated this approach. They showed that the attitude toward the ad (A_{ad}) played a mediating role between exposure to the ad and attitude toward the brand, even for highly involved individuals (Lutz et al., 1983; Gardner, 1985; Lutz, 1985; Batra, 1986; Batra and Ray, 1986; MacKenzie et al., 1986; Mitchell, 1986; Park and Young, 1986).

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As far as children are concerned, studies concentrating on this connection are missing. The main contribution of the current study is a theoretical one, as it helps validate the existence of a link between A_{ad} and A_b among children and first of all brings out the best predictors of both A_{ad} and A_b. The second point is a methodological one. Emotional reactions upon exposure to the ad are measured in two ways: firstly through a classic verbal approach, and secondly through an observation of facial reactions. The conditions recreated in our laboratory were as close as possible to the exposure to ads in real life: we minimized forced exposure, the children were not aware they would see ads and not aware of being filmed while watching these ads which were embedded in a program especially conceived for them.

2. Background

2.1. Cognitive and affective reactions elicited by the ad

The first studies on A_{ad} concentrated on belief formation vis à vis the elements (hedonic or rational) that make up the ad (Shimp, 1981; Belch, 1982; Lutz, 1985). Besides, the first paradigms proposed to elucidate the relationship between A_{ad} and A_b consider ad cognitions (C_{ad}) as the only predictor of A_{ad} (Lutz et al., 1983; MacKenzie et al., 1986). In parallel, and consistent with the ELM model of Petty and Cacioppo (1986), Lutz (1985) proposed four models of persuasion by connecting two levels of involvement concerning the execution with two levels of involvement concerning the message. In three out of these four cases, the only determinant of A_{ad} is C_{ad}. In the fourth case (Pure Transfer), where the two types of involvement are low, it is the general attitude toward advertising.

Even authors who suggest that peripheral elements can influence both the formation of an attitude toward the ad and the A_{ad}–A_b relationship, do not escape from a predominant emphasis on evaluative predictors. For example, Park and Young (1986) demonstrated that music, while causing interference with message processing for those who were highly involved, facilitated the forming of an opinion of low involved individuals.

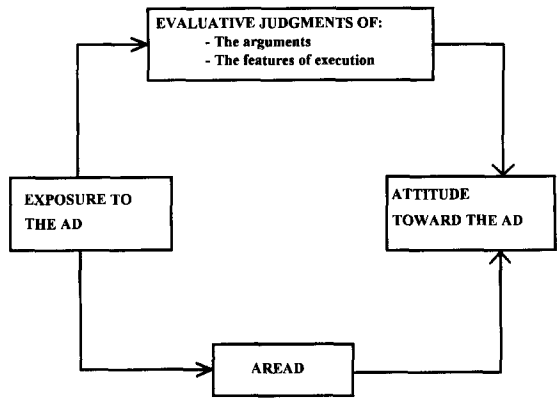

Fig. 1. Main components of A_{ad}.

On the other hand, considering A_{ad} as merely the consequence of an evaluation does not seem to be satisfactory for many researchers (Batra and Ray, 1986; Edell and Burke, 1987; Burke and Edell, 1989; Batra and Holbrook, 1990; Olney et al., 1991) who stressed the necessity of taking into account a more personal variable, encompassing all the affective reactions elicited by the ad (AREAD) during the exposure.

To conclude, it seems that the attitude toward the ad can come from three main predictors (see Fig. 1), the respective weight of which seems relevant to evaluate: the central elements of the message, the peripheral elements of the message and the affective response elicited by the ad.

2.2. Affective responses of children as consumers

The idea that children's responses toward an ad may be organized around affective dimensions is not new. Observational studies and casual examination of children watching commercials revealed very often responses such as "that bores me" or "looking at it makes me feel good". Even if the brand is presented very attractively, i.e. in such a way that it kindles the viewers' desires, the proposed benefit may often be considered of secondary importance.

What children seem to look for in an advertisement is a state of mind where special elements can be strong enough to generate a feeling of pleasure. For commercials as for other TV programs, positive or negative reactions will essentially depend on details such as the tone of voice, the presence of a

small animal, an onomatopoeia that makes them laugh,... (Cullingford, 1984). When the message interests them, their emotional reactions will immediately become intense: laughter, annoyance, mimicry, pleasure,... (Kapferer, 1985).

Although many researchers underline the importance of children's affective reactions, a synthesis of thirty years of research (Brée, 1993), revealed that the main conceptual frameworks have been theories of cognitive development and of social learning. The most contributive studies conducted during the 80's dealt indeed with cognitive abilities, information processing capacities, and children's decision-making (Roedder, 1982; Macklin, 1983; Macklin, 1985; Soldow, 1985; Bahn, 1986; Poiesz, 1986; Roedder-John and Cole, 1986; Roedder-John and Withney, 1986; Roedder et al., 1986; Ward, 1986; Macklin, 1987a; Brucks et al., 1988; Roedder-John and Sujan, 1990; Peracchio, 1992; Roedder-John and Lakshmi-Rahan, 1992; Macklin, 1994). Only van Raaij (1986) tried to integrate cognitive and affective factors in a common framework.

If we agree with Robertson and Rossiter (1976a) and Friedstad and Wright (1994) that the first defense against a commercial is a cognitive one, i.e. the ability to understand the informative and persuasive intents, we cannot reduce the (desirable) response of a child to an advertisement at this capacity. In this case, it would mean that when the affective response prevails it is because he/she is not able to develop consistent beliefs or counter-arguments. Children's reactions may simply differ from adults' reactions because their goals are different. Adults look at commercials — partially — for information purposes. Children have fewer reasons to do so. Finally a lot of differences in cues that are typically used by children and adults might as well be due to differences in style or preference than due to a difference in ability.

As underlined by Wartella (1984), both emotions and feelings will play a major role in explaining how persuasion works, especially with children. So, when an affective dimension is strongly linked to a given task, it will act as a catalyst which will reinforce the motivation to complete the task. By means of conjoint analysis, Brée (1987) showed that on an equivalent difficulty level, the child managed a higher degree of coherence in the trade-off between the different prices, brands and bonus proposed when he/she could get some benefit from it.

Also, Derbaix (1982) tested in the 'hierarchy of effects' followed by the child after exposure to TV ads, that the affective factor was the dominant one. His model, called "the Emotional Reaction Hierarchy", led him to successfully carry out experiments showing the following sequence till the third exposure: Affective → Conative → Cognitive on a sample of seven-year old children. These results corroborate those of other studies demonstrating an increase of positive attitude toward the brand until the third contact and a levelling off or even a slight decrease thereafter (Gorn and Goldberg, 1977; Goldberg and Gorn, 1978).

As Roedder et al. (1986) have shown, the strength of the last response serves to adequately explain some apparently 'incoherent' reactions of the child. Indeed, these authors rightly put forward that coherent behavior occurs when the attitude associated with each alternative is mainly the result of an evaluative process. The incoherent children are those who will be mainly influenced by the last ad they have seen (even if by another way they have much more positive attitudes toward several other choices and even if they are aware of the selling intents of the commercials).

As far as children are concerned, there is a problem we do not have with adults: a possible confusion between A_{ad} and A_b. According to Robertson and Rossiter (1976b), not before the age of 9, does a distinction appear between the attitude toward the brand itself, the attitude toward the brand as depicted in the commercial, and the attitude toward the ad itself. This can lead to two opposite hypotheses for younger children: either there exists a natural strong correlation between the valences and intensities of these variables or the relationship appears by pure coincidence.

Although Goldberg and Gorn (1978) advocate that a negative attitude toward an ad could be associated with a similar attitude toward the product itself, the knowledge of the link between A_{ad} and A_b for children remains more hypothetical than validated by empirical research. Some studies have concentrated on the influence of advertising versus non-commercial TV programs on children's requests (Resnik and Stern, 1977; Ward et al., 1977). They showed the

superiority of the former over the latter but without integrating important latent variables such as attitudes. Indeed a lot of intermediate variables can be put forward for explaining the results of these studies: the level of credibility associated to television, the fact that the brand is salient in the children's mind, cognitive dimensions like not mastering advertising language,... (Young, 1986). However, things are perhaps changing.

2.3. The measurement of affective reactions

Several techniques allow the measurement of affective reactions in general and of emotional reactions in particular. The most common technique in marketing is the use of attitude scales. However, there are other methods, such as the observation of facial reactions or even the measurement of physiological responses (sweating, heartbeat, pupil dilation, etc.).

Attitude scales are frequently used to collect information from children. Nevertheless, the absence of validated constructs, a lack of coherence in the number of points of the scales used and undependable methods of data collection can cast doubt on the results (Rossiter, 1977; Rossiter, 1978; Brée, 1991; Macklin, 1987b; Macklin and Machleit, 1990; Mangleburg and Tech, 1990).

Nevertheless, this classical approach has numerous advantages. It offers the possibility of stressing the polarity, the intensity and the content of emotions. This is particularly true if one helps the respondent (by providing an explicit list of affective reactions) and if he/she does not use 'display rules', thereby voluntarily altering affective reactions. In addition, this method does not require sophisticated logistics and the format of the data makes their analysis much easier. But with this approach there is a lack of consideration given to impulse measurement as advocated by Kroeber-Riel (1979). When asked to verbalize an emotion, there is always the risk of rationalizing, interpreting or even modifying the real reaction. As underlined by Cohen (1991), subsequent responses are necessarily a mixture of affective and cognitive elements.

Among the most promising tools in the verbal approach is the one developed by Rossiter and Percy (1991). They proposed the use of 2×2 matrix combining an individual variable (high/low involvement with respect to the product) and a variable linked to the type of ad (aiming mainly to reduce a negative motivation or mainly to increase a positive motivation). Kover and Abruzzo (1993) applied this method and seemed to confirm its predictive validity.

The second and quite different approach is that of coding facial expressions. It has now been accepted that the face is home to a system of rapid, emotion-revealing signals (Ekman, 1972; Ekman and Friesen, 1978; Ekman, 1993). As Derbaix wrote (Derbaix, 1993, p. 25): "The disguised observation of a motor behavior (facial expressions) offers the possibility of identifying affective reactions elicited by the ad (AREAD) in real time and in a non-reactive manner".

The approach has also numerous advantages. It needs no retrospection, nor introspection, nor any other particular comprehension problem on the part of respondents. It also allows recording us the chronological appearance of emotions. As for the inconveniences, three seem important: the necessity to possess costly equipment to be able to film precisely and without being seen, complex decoding which entails long and difficult training and a low probability of being able to observe weak affective reactions.

Derbaix (1995) has compared the measurement of adults' emotional reactions to ads using this method of facial observations with the measurement of the same reactions using verbal measurement scales. The addition of these affective facial measurements to those obtained on evaluative responses (prior A_b, evaluative judgements on the elements of argument and on the elements of execution) did not improve the quality of the explanation of A_{ad}, contrary to what happened when affective verbal measurements were added.

As for the third type of methods, psychophysiological measurements, Bagozzi (1991) pointed out their limits and deficiencies and the inability of most of them to gauge all the fundamental characteristics of affective reactions (intensity, polarity and content). In fact, reliable measurements have been obtained thanks to complex medical equipment, but this author clearly stressed that some are limited to intensity (psycho-galvanometer and electrical conductibility of the skin); others cannot reject alternative explanations (pupil reactions), or are focused on infor-

mation processing methods (electro-oculography), or have many methodological deficiencies (voice loudness analysis), or are confined to demonstrating cognitive elaboration (electroencephalograph), or cannot measure affective reactions (cardio-vascular reactions), or finally need highly technical equipment to specify polarity and intensity (electromyographic activity). To the best of our knowledge, the only marketing research on children using this technique is that of Vitouch (1986).

Some methods can be considered as part of this category even though they only need very simple material (i.e. paper and pencil) such as the 'Warmth Monitor' developed by Aaker et al. (1986). Vanden Abeele and MacLahan (1994) made measurements with this technique, but expressed doubts as to its efficiency.

As can be seen from the preceding arguments, none of the three approaches examined is devoid of deficiencies. As underlined by several authors (a.o. Derbaix, 1993), the simultaneous use of verbal and non-verbal measurements serves to lessen their respective drawbacks. They are highly complementary to overcome at least partially their inherent bias. What is more, obtaining convergence between results from different methods strengthens the validity [1] and helps 'to understand discrepancies among the different emotional responses' (Ekman, 1993, p. 386).

2.4. The observation of facial reactions in children

The first condition to use a method based on facial expressions of emotions postulated to be universal is to admit that this thesis is one of the best plausible alternative. Since Darwin (1872) this idea was proposed by many researchers, but it was not until the work of Izard (1971), Ekman (1972) and of Ekman et al. (1969) that the hypothesis of universality was adopted by numerous scientists [2]. However for Russell (1994) and others (including Klineberg (1940), Leach (1972) and Mead (1975)), the Universality thesis has not been definitely proven. In its most restrictive form, this thesis means the existence of separate specific facial configurations corresponding to the same number of separate specific emotions, easily recognized by all humans. In an insightful discussion of the extant literature, Russell (op.cit.) underlined methodological problems found in studies leading to the conclusion of the Universality thesis (preselected and posed facial expressions, forced-choice response format, previewing, within subject design, lack of contextual information, essentially western or westernized samples of respondents,...). Although we acknowledge that there are likely to be more than two alternatives (randomness and universality), we found the universality thesis a plausible alternative, available right now. Moreover we tried to minimize the above underlined deficiencies. We worked indeed with spontaneous and dynamic facial expression; we knew the expresser's context; the judges did not give a code to every facial expressions. Moreover partial coding of secretly videotaped faces illustrates the fact that our judges did not interpret facial expressions dichotomously [3]. Our coders were not found to be swayed by suggested labels. Our respondents and our judges were French speaking Europeans, i.e. peoples for which a 'westernality' thesis applies. Finally working a child at a time and knowing the setting make it possible to disentangle face–emotion knowledge from face–situation knowledge.

Several methods for measuring facial expressions have been developed. The most complete is FACS of Ekman and Friesen (1978). Three others (much simpler to use) concentrate more specifically on the processing of emotions: FAST of Ekman et al. (1971), and MAX of Izard (1979) and AFFEX of Izard and Dougherty (1980). Can such methods based on coding facial expressions be used on children? The answer is definitively positive. Firstly, because facial musculature is completely formed at birth. And secondly, because at 18 months a child has acquired all basic emotions, with the possible exceptions of shyness and contempt which can only emerge much later (Lewis and Michalson, 1983). There was therefore no problem concerning the children we

[1] Vitouch (1986) had also completed his physiological measurements with verbal data.

[2] For a complete review on the universality of facial expressions, see Ekman (1989, 1993) and Russell (1994).

[3] Our coders did not interpret the whole facial expression (see hereunder) but its component actions.

were interested in (7–10 year old). This was all the more so as MAX and AFFEX are particularly suited for children as the support material, composed of photos, drawings or videos of children experiencing emotional reactions, illustrate. MAX is characterized more particularly by separate examination of three zones on the face: the forehead and eyebrows (zone 1); the eyes, eyelashes and the bridge of the nose (zone 2); the bottom of the nose, the mouth and the chin (zone 3). A code is given to each of these three areas, and from the combination of these codes an emotion or not is inferred. AFFEX, on the other hand, is more holistic and consists of examining simultaneously the three zones of the face and in seeking a correspondence (photograph) which represents an emotion.

In order to be able to code our children's facial expressions using Izard's methods, we implicitly adopt the 'classical view' of emotions. Working within this 'discrete view', in which there are a finite number of fundamental affective states (Darwin (1872), Izard (1977) and others referenced by Lang (1994)), we have to realize that some facial expressions, for which there was no counterpart in Izard's material, were in fact not coded, or produced quite different coding from our judges. These facial reactions were thus not retained to be fed into our models. It is also possible that the manipulations (here the ads) to induce (pure) emotions produced, in fact, mixed emotions, decreasing the clarity of the signal. In contrast, Russell's prototype perspective presents the classical view as but an approximation to the inclusion relationships that hold within the emotion domain. His more 'continuous view' states that "at the middle level, prototypical emotions shade into less prototypical emotions, which shade into nonemotions with no sharp boundary to be found. This level therefore contains an indeterminate number of categories from anger to zest. For the same reason, the number of subcategories into which middle-level categories can be divided is indeterminate. At a given level, categories are not mutually exclusive but overlapping" (Russell, 1991, p. 38). Finally, it is quite possible that under some circumstances observers can not go beyond a distinction between pleasant and unpleasant (Woodworth and Schlosberg, 1954; Russell, 1994).

3. Tested model and hypotheses

3.1. General description

This research aims to replicate for children the work done by Derbaix (1995) for adults. The methodology followed is therefore similar. However, some of the measurements have been modified and strongly adapted to children. Involvement has been replaced by interest for the category of products since the concept of involvement has never been defined for children nor operationalized.

It is useful to recall that the general aim of the research was to validate a significant relationship between A_{ad} and A_b for children and first of all to determine the explanatory power of each predictor of A_{ad} and of a posteriori attitude toward the brand (A_{bp}). There was also a particular focus on the respective impact of verbal affective and facial affective variables.

The general model retained is illustrated by Fig. 2 where NVAREAD means nonverbal (facial) affective reactions elicited by the ad. Moreover, we also postulated the existence of a direct relation between

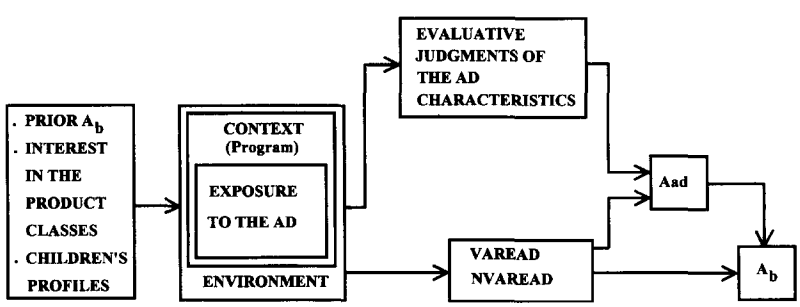

Fig. 2. General framework of our research.

the affective reactions elicited by the ad and the attitude toward the brand. Considering the 'hierarchy' identified by Derbaix (1982) and the possible confusion between A_{ad} and A_b (Robertson and Rossiter, 1976b), an affective halo could make AREAD a predictor of A_b, just like A_{ad} or specific beliefs about the brand (see Fig. 2).

3.2. Hypotheses

In order to study the relationships of our general framework, the following hypotheses were tested:

H1. In the evaluation of ad characteristics by 7–10 year-old children, the elements of execution predict A_{ad} better than the elements of argument do.

Considering commercials mainly as a show, even when he/she is aware of its informative and persuasive aims, does the child base his/her evaluative reactions on the message's elements of execution (story, music, characters, action,...) or on more rational elements of arguments? We postulate that A_{ad} and persuasion mechanisms will essentially be based on peripheral processing.

H2. The addition of affective reactions — verbal as well as facial — to the a priori attitude toward the brand and to the evaluation of the ad characteristics improves significantly the explanation of the attitudes toward the advertisement and the brand.

From what precedes, we do believe that affective reactions matter in explaining A_{ad} and A_{bp}. Moreover, as stressed above, verbal affective reactions and non-verbal expressions of affective reactions do not tap — particularly with children — exactly the same aspects of common underlying constructs.

Finally in our quasi-naturalistic context and with our type of respondents we are convinced that affective reactions elicited by the ad are not overridden by attentive processing of ad characteristics as it may be in pretest settings with adults as respondents.

H3. The contribution of affective reactions, verbal as well as facial, to the explanation of A_{ad} and A_{bp} is superior or equal to that provided by a priori attitude toward the brand and the judgments on the ad characteristics.

$H3_{bis}$. Moreover, with 7–10 year-old children, facial measurements of emotions, outperform verbal measurements of these emotions in predicting A_{ad} and A_{bp}.

We postulate that facial observations give richer measurements than those obtained in adults by Derbaix (1995). The natural spontaneity of children, allied with weaker social checks when it comes to expressing an emotion (especially when they are not aware of being filmed), results in emotions triggered by stimuli such as commercials. From Izard (1977) [4], it could be anticipated that children show the pure facial expressions more often than adults. However, it seems more so for some emotions (joy, surprise,...) than for others (fear) since it is rare that the minimum intensity threshold necessary to provoke such a (negative) reaction is reached with commercials.

Let us also stress that audio–visual material contains different dimensions able to evoke affective reactions and that most of the ads used in our research were unknown, so their ability to elicit varied affective reactions is greater than regularly aired ads. At this level, the researcher is facing a conundrum: natural and highly intense emotional elicitors are not feasible in the laboratory, for ethical and practical reasons, whereas recording close-ups of participants' facial expressions is a task that involves formidable practical problems outside a laboratory (Fernández-Dols and Ruiz-Belda, 1995, p. 1114).

H4. A_{ad} is a significant predictor of A_{bp}, especially in the case of unknown brands.

In accordance with Goldberg and Gorn (1978) and like Macklin (1988), we postulate the existence, in children, of a very strong relationship between the attitude toward the ad and the attitude toward the brand. Moreover, we agree with Robertson and Rossiter (1976b) concerning the confusion which may arise between these two constructs for children and we believe that the effects would be a reinforcement of the A_{ad}–A_{bp} relationship.

4. Method

Although we are dealing with affective reactions, our discourse will not be lyrical or poetic (Holbrook, 1990) because our goal was not to thoroughly de-

[4] See Oster et al. (1989) and Camras (1992) for another point of view.

scribe emotions in a study from an ethnographic type. As explained above our goal is to highlight the best predictors of both A_{ad} and A_b as well as the relationship among these two constructs. Therefore, the most suitable approach to achieve this goal is the experimental one.

4.1. Subjects

Seven hundred and seventy children, from 7 to 10 years were approached in class by four collaborators. From these 770 children, 152, whose parents agreed to come with them in our research center, participated in a lab-session a few days after having filled out a first questionnaire in class. They were evenly split as sex (74 boys and 78 girls) and age (age 7: 37; age 8: 34; age 9: 38; age 10: 43) are concerned.

4.2. Stimuli

We selected eight 30″ commercials. Two were known ads for familiar brands (Contés' pencils and a video-game: Super Mario), three were unknown ads for familiar brands (Nesquik, Kitkat and Suchard) and three were unknown ads for novel brands (a parlour game, a candy and a more or less scientific magazine for children). From these eight commercials, two strings — differing in the fifth and the sixth ads — were built on the following pattern: [X, G, H, I, A, B] with X and I as known ads for known brands; G and A unknown ads for known brands; H and B unknown ads for unknown brands. About 76 subjects were assigned to this string and 76 to a string differing only on the fifth and sixth ads which were also respectively an unknown ad for a familiar brand and an unknown ad for a novel brand. Half of the subjects in each of these groups (i.e., 38 subjects) were assigned to these strings presenting the ads in these orders and the 38 other children in each group were assigned to a string differing on the order of the last two ads. All this was achieved after the pretest of our design which led us to realize that questioning our young respondents thoroughly was possible only for the last ad they saw.

The ads were selected to cover a range of products particularly suited to our young respondents. Moreover, they had provoked among children during the exploratory research phase and among the eight people having collaborated in the building of the design relatively low variance in ratings of affective responses to the same ad (to 'ensure' that the stimulus generated fairly homogeneous affective responses) and high variance across the different ads. The unknown ads (in France and in Belgium) came from Quebec and Switzerland where they were regularly aired. These unknown commercials were selected in order to be able to elicit the whole spectrum of affective reactions and were targeted at boys as well as at girls.

TV was selected on the basis that this medium is spontaneously evoked by children when speaking of advertising. It is also more adapted to the study of affective reactions (the subjects being in a situation where the likelihood of cognitive elaboration seems low due to the lack of control of the pace of diffusion). Finally, this medium is appropriate for the recording of facial expressions. These ads were preceded by a film (program).

4.3. Procedure

When contacted (in class), our respondents were told that the study concerned their preferred TV shows, comic strips and a new type of program especially designed for them. Three or four days later, the child — generally accompanied by his (her) mother — came to our research center. Our lab was designed to maximize a natural environment for children with posters of pets, various habitual objects,... . Each child saw, on TV, a film about a magician and then a string of six commercials similar to strings he could see while watching TV at home.

It should be noted that irrespective of the group to which the child was assigned (four groups of 38 children), the last two ads (on which they would be thoroughly questioned) are always preceded by the same four ads, thus minimizing the risk of a different 'impact' of the first ads on the affective reactions elicited by the last two commercials.

We conducted a pretest of our design to examine if it was realistic, if there were important problems of comprehension and if it was possible to work with two children at a time. This last option was disregarded on the basis that it is almost impossible to rule out the possibility that facial expressions of

children viewing commercials in couples are at least partially elicited by the other child. So in our study, displays (of facial expressions) were recorded when the expressor (the child) was alone. These are the 'least social' expressions [5], leading to a spontaneous (as opposed to a voluntary) expression of genuine emotions. Otherwise stated, facial expressions can thus here be viewed as readouts or symptoms of underlying affective states (Hess et al., 1995, p. 285). Of course working with a child at a time we are losing information about social factors as essential determinants of facial expressions (Hess et al., 1995). But otherwise it would have been impossible to disentangle the mere impact of commercials from that generated by the other child's reactions (as far as the origin of affective reactions is concerned). Moreover, it was much more difficult to film very precisely their face when they were not alone. At a more technical level the film was slightly reduced in order to avoid a decrease in attention due to a too long program. During this film a collaborator (a girl) stayed and talked with the child to make him (her) as comfortable as possible. She left the lab a few seconds before the commercials. After the pretest, a few questions were reformulated and the one on beliefs was eliminated because it was clear that beliefs were created more by the questions than by the ad or any other sources. This pretest was achieved with 25 children.

With this kind of procedure, we are convinced that the treatment was 'lived' in a natural way. Indeed the children did not know they would see TV ads at the end of the film. During the commercials, the respondents were not aware of being filmed [6] (by a camera behind a one-way mirror). At the end of the lab session, parent's permission to use their child's video-taped face was required in writing (in general the mother was with us in an adjoining production room where we saw the child on various screens and remote-controlled the camera). After the string of commercials (so after 10 minutes = 7 minutes of film and six 30″ commercials), the collaborator came back in the lab for the first interview. At this moment, the respondent was asked about his/her A_{ad} concerning the last ad he/she saw. After that, he/she completed the verbal affective reactions inventory followed by his/her evaluative judgments of the ad characteristics (arguments and executional features). Then they were asked several questions about the film and had to rate their post exposure attitude toward the brand advertised in the last ad. After that he/she was left alone to see a second time the first ad and was asked immediately after this second viewing his (her) A_{ad} for this ad. This procedure was repeated for the second, third and fourth ads of the string. For the fifth ad, after a second viewing, the procedure applied to the sixth ad was repeated (O_6 similar to O_1, see Fig. 3).

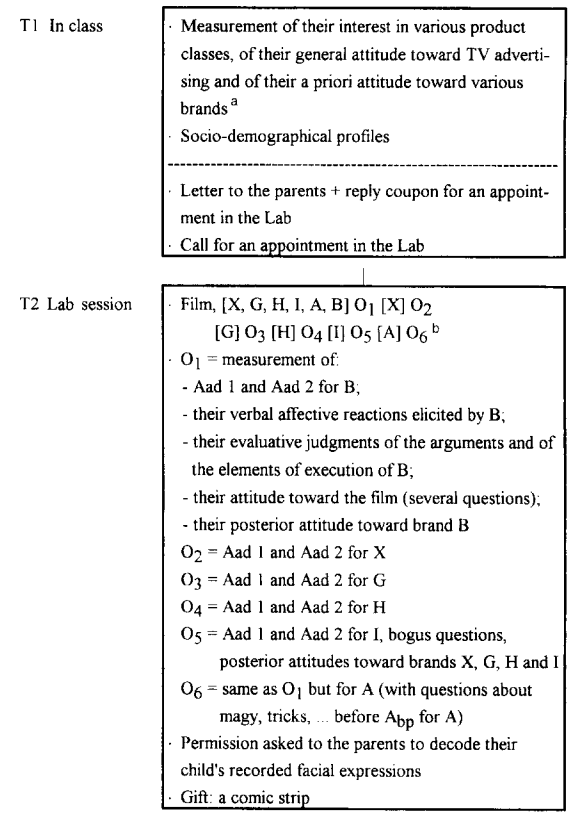

Fig. 3. Final design.

[a] The ones they will see in the lab session (if they come) plus several others.

[b] During the string and a second time for X, G, H, I and A the children's facial expressions were recorded.

[5] For Denzin (1984, p. 407) "Emotions are interactive processes best studied as social acts involving self and other interactions".

[6] To the extent that children are able of suppressing, falsifying and distorting their facial expression.

4.4. Measures

In T_1 (in class), besides the respondents' profile, we measured: the child's general attitude toward TV advertising (using the Rossiter scale), his/her (prior) attitude toward various brands (among which those that would be used in our lab session) and his/her interest in the product classes selected for our research (candies, video-games,...). This last variable was measured by the following questions: "If you have enough pocket money and can only buy one thing with it, which one would you choose", "If you now have enough money to buy a second product, which one would you choose",... and finally "If you have enough money to buy all these products, are there any you wouldn't buy? Which ones?"

The verbal affective reactions scale (hereafter VAR scale) was developed in the pilot study described above. Instructions for completing the inventory were as follows: "Here is a list of questions about the last ad you just saw. Please indicate how much you felt each of these affective reactions you have perhaps experienced while watching the ad". Their answers to 13 verbal affective reactions [7] were recorded on a 4-point scale anchored by 'Not at all' and by 'A lot'. Before answering the VAR scale (in the laboratory), the child indicated his/her A_{ad} in two different ways. A_{ad} 1 was measured on a 4-point scale anchored by "I like this ad very much" versus "I don't like this ad at all". A_{ad} 2 took into account a non-weariness dimension: "I would really like to see this ad again" versus "I don't feel like seeing this ad again". The instructions for completing evaluative judgments of the arguments were: "Now, I will ask you some questions about what you saw or heard in the last ad". Three evaluations of the arguments (how informative, believable and helpful to understand the product they were) were measured along 4-point bipolar scales. Using similar scales, the evaluations of the executional features were recorded for the characters, the music, the colors, the story, the action and the level of complexity. A few questions were then asked about the film. Afterwards, their post exposure attitude toward the brand was measured in a classical way on a 4-point scale (I like Nesquik "not at all"..."a lot") [8]. As already said, this procedure was repeated for the fifth ad, after its second viewing. For the other ads in the string, the children only indicated their A_{ad} — after a necessary second viewing — using our two scales as well as their A_{bp}.

The simplicity (number of points on each scale) and the number of items for each scale were based on the literature and on previous research with this type of young respondent.

5. Coding facial expressions

Among others, Izard (1982), Ekman (1972, Ekman, 1993) and Smith (1989) report support for the ability of distinct facial expressions to convey emotions. Considered as an organism's overt expressive behaviors, facial expressions tap purer affective reactions than verbal measures which are a mix of cognitive and affective reactions.

In our laboratory, filming facial expressions took the form of an unobtrusive impulse measurement, i.e. a continuous one-line monitoring technique not disruptive of cognitive and/or affective processes. Indeed, as opposed to verbal instruments, filming facial expressions allows for diagnosticity about how changes in message content and executional features affect facial expressions, e.g. emotional reactions. Moreover, we do not have with facial expressions some of the classical recall problems induced by verbal measurements: omitting (leaving things out), averaging (the tendency to normalize things and not to report extreme cases) and telescoping (inaccurate recall of time, problems related to the reporting of the sequence of experienced affective reactions).

More than a decade ago, Izard (1983) designed two complementary systems (MAX and AFFEX) for measuring facial expressions in infants and children. The eight primary emotions included in MAX are: interest, joy, surprise, sadness, anger, disgust, contempt and fear.

[7] Amused, nervous, anxious, joyful, interested, happy, disgusted, angry, annoyed, sad, fearful, pleased and surprised.

[8] As their a priori attitude toward the brand (A_{ba}) measured 3 or 4 days before participating in the lab session in order to minimize an interaction with the treatment.

Table 1
Verbal affective scales

$POSVR_k$	positive verbal reactions (amused, joyful, interested, happy and pleased) in the case of known brands ($\alpha = 0.84$)
$POSVR_u$	positive verbal reactions (amused, joyful, interested, happy and pleased) in the case of novel brands ($\alpha = 0.86$)
$NEGVR_k$	negative verbal reactions (nervous and anxious) in the case of known brands ($\alpha = 0.56$)
$NEGVR_u$	negative verbal reactions (nervous, anxious and fearful) in the case of novel brands ($\alpha = 0.61$)
$VRBO_{k\,or\,u}$	verbal reaction of boredom
$VRNS_{k\,or\,u}$	verbal reaction of non-positive surprise
$VRPS_u$	verbal reaction of positive surprise

In our study, we used the precision of the MAX coding system while working with AFFEX a more holistic system. In fact, using MAX would have been much too long. We had to code eleven sequences of thirty seconds of facial expressions [9] for each of our 152 children, i.e. 836 min. Therefore, we advised our coders to look at the entire face and to code simultaneously two areas: the forehead, the eyebrows, the eyes and the nose on the one hand, the mouth and the chin on the other hand. During the coding sessions, all the codes and their corresponding faces (coming from Izard's material) were displayed on large boards in front of the coders to assist them. Six 2 h training sessions were conducted by a specialist before starting to code our material.

A classical coding session was as follows:

– the three coders [10] saw in 'real time' the sequence and looked for changes in the child's face,

– the patterns of change being identified, the coders decided in common about the start and the end of each pattern of change in the sequence,

– then, taking a pattern of facial change at a time, they

- stopped the tape at the place where the pattern of change was clearly apparent,
- identified the codes corresponding to the pattern and from these codes identified the corresponding affect,
- computed an interjudge reliability coefficient and to the extent that this coefficient was at least 0.66, computed a score for each identified emotion taking into account the duration of the pattern.

This way of working led to twenty-eight coding sessions of five hours. The technical details of this lengthy procedure — which was a mix of MAX and AFFEX — could be found in Izard (1983) and a complete description of these two complementary systems in Izard and Dougherty (1980).

6. Results

6.1. Descriptive results

We performed two principal component analyses in order to portray the structure of our fourteen [11] verbal affective variables: one in the case of known brands and one in the case of novel brands. Fifty percent of the variance was recovered with three factors for the known brands and 52% for the novel brands. To construct our verbal affective scales, we took essentially into account the loadings on the axes. Disgust, anger, sadness, fear and positive surprise did not 'load' at least 0.5 on any factor and were therefore eliminated in the case of known (familiar) brands. So was the case for disgust, anger and sadness for the novel brands.

Two clusters that could easily be interpreted as positive affective reactions (factor 1) and as negative affective reactions (factor 2) appeared in the two principal component analyses. Two isolated variables (boredom and nonpositive surprise) for the known

[9] The six ads + the first five seen a second time.

[10] These persons and one of the authors spent more than a week with Izard's training tapes concerning the Maximally Discriminative Facial Movement Coding System (MAX) under the guidance of a specialist.

[11] Surprise was polarized by the respondent himself (herself) or more exactly described as being positive, neutral or negative. Very few respondents used this third option. In our final analysis achieved with respondents for whom we had almost all the data, we used the label nonpositive surprise for neutral and negative surprise.

Table 2

	Judgment scales	Dependent variables	
$AVARGEL_k$	average of the evaluative judgments concerning the arguments in the case of familiar brands ($\alpha = 0.67$) [a]	A_{ad_k}	average of A_{ad} 1 and 2 ($\alpha = 0.76$)
$AVARGEL_u$	average of the evaluative judgments concerning the arguments in the case of novel brands ($\alpha = 0.57$) [a]	A_{ad_u}	average of A_{ad} 1 and 2 ($\alpha = 0.82$)
$AVEXEL_k$	average of the evaluative judgments concerning the first 5 [b] elements of execution in the case of familiar brands ($\alpha = 0.76$)	$A_{bp_{k or u}}$	a posteriori attitude toward the brand
$AVEXEL_u$	average of the evaluative judgments concerning the first 5 [b] elements of execution in the case of novel brands ($\alpha = 0.79$)		
$EXEG_{k or u}$	the sixth element of execution		

[a] Principal component analyses on the three elements of arguments clearly showed the unidimensionality of this new construct.
[b] Principal component analyses on the elements of execution clearly showed that the first five elements load on the first factor and the sixth one on a second axis.

brands and three isolated variables (boredom, non-positive and positive surprise) for novel brands were kept, due to very important loading on a factor. The affective scales we formed are displayed in Table 1 along with their Cronbach α.

Our other independent variables are presented in Table 2 along with our four dependent variables. The scale for arguments was formed by summing up the ratings of the three evaluative-items of message elements relevant to forming a 'reasoned' opinion (appreciation of the claims). The same procedure was carried out for the elements of execution.

As far as 'Facial' variables are concerned, about 70% of the possible facial expressions were not displayed by more than one child and were thus eliminated. Facial expressions of joy, interest and to a lesser extend of fear, surprise and anger were the most frequently coded for the last two ads.

7. Test of the hypotheses

The primary purpose of our research is to test our hypotheses in a kind of setting, rarely used in studies reported in extant literature and for the first time with children for whom we had facial expressions. This was achieved through an analytical approach comprising the following models for A_{ad}:

(1) A_{ad} = constant + A_{ba} + the judgment scales (*evaluative model*)
(2) A_{ad} = (1) + the verbal affective scales (*verbal affective* and *evaluative model*)
(3) A_{ad} = (2) + the non-verbal (facial) affective reactions (*total model*)
(4) A_{ad} = (1) + the non-verbal (facial) affective reactions (*facial and evaluative model*)
(5) A_{ad} = constant + the verbal affective scales (*verbal affective model*)
(6) A_{ad} = constant + the non-verbal affective reactions (*facial affective model*)
(7) A_{ad} = constant + the verbal affective scales + the non-verbal affective reactions (*total affective model*)

In model (1) there is of course no A_{ba} for novel brands. Models (1) through (7) were also tested with A_{bp} as the dependent variable with the following theoretically-driven adaptation. In a second phase of analysis, we substituted A_{ad} for the evaluative judgments of the ad elements in the equations explaining A_{bp} in order to test if the impact of affective reactions on A_{bp} was mediated by A_{ad}.

Before estimating our models for known versus unknown brands separately, we checked the relevance of this distinction. This was achieved by testing for the significance of interaction terms involving the known/unknown dummy variable (see details in Appendix A). We first applied this procedure to a simplified version (for the known brands), i.e. dropping A_{ba}, of the evaluative model (1) explaining

Table 3
A_{ad_k} = constant + A_{ba} + $AVARGEL_k$ + $AVEXEL_k$ + $EXEG_k$. 10 cases deleted due to missing data. DEP VAR: A_{ad_k}; N: 142; multiple R: 0.635; squared multiple R: 0.403; adjusted squared multiple R: 0.386; standard error of estimation: 0.569.

Variable	Coeff.	Std. error	Std. coeff.	Tolerance [a]	T	P (2 tail)
Constant	0.596	0.395	0.000	–	1.512	0.133
A_{ba}	0.045	0.043	0.072	0.957	1.064	0.289
$AVARGEL_k$	0.009	0.061	0.010	0.878	0.146	0.884
$AVEXEL_k$	0.798	0.093	0.615	0.856	8.616	0.000
$EXEG_k$	−0.028	0.072	−0.025	0.995	−0.384	0.702

[a] Tolerance is one minus the squared multiple correlation between each predictor and the remaining predictors in the equation. Low values of tolerance indicate that some of the predictors are highly intercorrelated.

A_{ad} [12]. The estimation of the *pooled* regression equation explaining A_{ad} was achieved with AVARGEL, AVEXEL and EXEG and as interaction terms these 3 predictors times D_1. The results showed that the evaluation of the elements of execution was highly and similarly significant in explaining A_{ad}. We did the same for the explanation of A_{bp}, discovering a very slight difference: AVEXEL was highly significant in both cases but even more so for unknown brands.

Adding to this simplified evaluative model the verbal affective variables highlighted a significant difference for A_{bp}: verbal reaction of boredom was only significant in the case of unknown brands. One more time AVEXEL was more significant in the case of unknown brands in explaining A_{bp}. No difference emerged for A_{ad}. Adding the non-verbal variables showed that the facial expression of interest at the first viewing was only slightly significant for A_{ad} in the case of unknown brands whereas facial expression of joy at the first viewing was only significant for known brands. So on the basis of these results and also on the fact that the negative verbal reactions did not encompass the same variables for the ads of known brands (nervous and anxious) as for the ads of unknown brands (nervous, anxious and *fearful*) [13], it seemed advisable to test our models for known and unknown brands separately.

The first model estimated in the case of known brands was model (1). The R^2 was 0.403. The results of this very first estimation are reproduced hereafter.

7.1. Test of H1

To the extent that, in the domain of affective reactions, predicting a sign of influence is somewhat hazardous, we worked with P (2 tail) in all our analyses. $AVARGEL_k$, A_{ba} and $EXEG_k$ were not statistically significant but $AVEXEL_k$ was highly significant (Table 3). The R^2 of the model: A_{ad_k} = constant + AVEXELk was 0.398. In order to pinpoint the significant variables in all our estimated models (7 models × 2 types of brands × 2 dependent variables) a screening procedure was applied. This procedure based on three criteria (value of the t-test; ratio std/mean of each variable and tolerance) is detailed in Table 4 and was applied to all our estimated models [14]. Applying this procedure *here* led to an equation where A_{ad_k} was explained by the sole $AVEXEL_k$ ($R^2 = 0.398$ and t-test = 9.729).

The ELM (Petty and Cacioppo, 1986) — which strictly applies to A_b — contends that central processing is likely to occur only when ad receivers have the motivation and ability to process ad claims. Applying this model to the children's attitude toward the ad, it seems that our young respondents clearly followed a peripheral route.

For novel brands, the estimation of model (1)

[12] In order to use the standard way in which a moderator variable is tested for (e.g. Baron and Kenny, 1986), we have to work with predictors that are simultaneously present for known and unknown brands.

[13] See Section 6.1.

[14] This led to eliminating one variable at a time and re-estimating (each time) the equation until all the predictors were significant (P (2 tail) ≤ 0.10).

Table 4
Keeping or eliminating explanatory variables

Rule	Value of the *t*-test	Ratio: standard deviation/mean (of the variable)	Tolerance	Decision
No. 1	low	low	· never mind · if high it is really "one of the worst" variables	to rule out this variable (without consequence on the other paramaters to be estimated)
No. 2	low	high	high (no collinearity)	to rule out (this variable is an outsider; extraneous to the topic; nothing to do with the dependent and the other independents)
No. 3	low	high	low (collinearity)	do no rule out in the first phases of the screening process
No. 4	high	high (or rather low)	high (no collinearity)	to be kept; most accurate estimations in this case
No. 5	high	high or low	low (collinearity)	to be kept; less accurate estimations

Source: Bultez and Derbaix, in Derbaix (1993).

(A_{ad_u} = constant + $AVARGEL_u$ + $AVEXEL_u$ + $EXEG_u$) followed by the screening process, detailed above, led to a very similar result: $AVEXEL_u$ was the only significant variable ($R^2 = 0.419$, $t = 10.256$).

7.2. Test of H2

To test our second hypothesis, we estimated model (2) by adding the verbal affective reactions to model (1). For known brands, the squared multiple R jumped from 0.403 to 0.502. To test H2, first with model (2) (i.e. to see if adding verbal affective reactions led to a significant improvement of the explanation of A_{ad_k}), we used the F_{ADD} (Kerlinger and Pedhazur, 1973). This statistic tests whether the increase in R^2 from adding variables to a model is statistically significant. This first test was highly significant ($F_{ADD} = 6.56$, $p < 0.001$).

This procedure was applied — using models (1) through (4) — for familiar and novel brands and for our two dependent variables (A_{ad} and A_{bp}). In three cases out of four, H2 was supported for verbal affective reactions. In fact, model (2) was a real improvement with respect to model (1), but model (3) was never a significant improvement with respect to model (2). Neither was the case for model (4) with respect to model (1). Table 5 summarizes the results of the test of H2.

Table 5
Regression results for H2

	R^2 comparison			
Dependent variables	Evaluative model (1)	Verbal affective and evaluative model (2)	Total model (3)	Facial affective and evaluative model (4)
Known brands				
A_{ad_k}	0.403 (0.403)	0.502 [a]	0.520	0.423
A_{bp_k}	0.298	0.338	0.342	0.302
Unknown brands				
A_{ad_u}	0.426 (0.423)	0.546 [a]	0.554	0.430
A_{bp_u}	0.254	0.324 [b]	0.327	0.255

The significance of the increase of the R^2 of models (2) and (4) with respect to model (1) and of model (3) with respect to model (2) is reported at two levels: [a] $p < 0.001$ and [b] $p < 0.01$.

For A_{ad_k} and A_{ad_u} we have in brackets the results without the evaluative judgments concerning the arguments among the explanatory variables [15]. For the total model (and for our whole sample of respondents) we add the facial expressions displayed during the first viewing [16] to the independent variables of model (2).

The screening processes applied to our different models highlighted $AVEXEL_k$ and Positive Verbal Reactions ($POSVR_k$) as the strongest predictors of A_{ad_k}; a priori attitude toward the brand (A_{ba}) and $POSVR_k$ as the main determinants of A_{bp_k}. $AVEXEL_u$, Positive Verbal Reactions ($POSVR_u$) and the verbal reaction of positive surprise ($VRPS_u$) were the most significant predictors of A_{ad_u}. For A_{bp_u} the screening processes essentially showed that $AVEXEL_u$, $POSVR_u$ and $VRBO_u$ (verbal reaction of boredom) were the most significant explanatory variables. Non-verbal reactions were almost never significant in explaining A_{ad} or A_{bp}. As a tentative conclusion, it seems clear that the evaluative judgments concerning the elements of execution (except the sixth one) and the positive verbal reactions (amused, joyful, interested, happy and pleased) elicited by the ads are the underlying factors of advertising effectiveness. Let us also stress that the influence of these variables were in the directions expected, i.e. positive.

7.3. Test of H3

For H3, we used the *J*-test (Davidson and MacKinnon, 1981, see also Kennedy, 1992, p. 87). This test is designed to compare two non-nested alternative models. The *J*-test embeds the alternative models, i.e. the evaluative model (1) and the total affective model (7), into a general model. This test involves a two-stage estimation procedure. First the evaluative model is estimated and the predicted dependent variable from that model is inserted — with for example the total affective model — into a general model which is in turn estimated. Then, this procedure is inverted [17], reversing the role of H0 and H1. When this is done, it is conceivable that both models (hypotheses) may be rejected or that neither of them be rejected. This procedure was applied to the comparison of the evaluative model (1) with the three affective models ((5), (6) and (7)) which of course share no independent variables with it.

As far as the attitude toward the ad is concerned, the *J*-test indicates that the evaluative and the verbal affective models were equivalent. For A_{bp_k}, presumably due to the weight of previous experiences (A_{ba}), the evaluative model *outperforms* the three affective models in explaining the post exposure attitudes toward known brands. For A_{bp_u}, the evaluative model was statistically slightly better than the verbal one when the format of the evaluative model was that of model (1). In an alternative formulation (A_{bp_u} = constant + A_{ad_u}), we got the opposite result: the affective models (verbal and total) were better.

For A_{ad}, in brackets, we have the results of the evaluative model without the arguments among the explanatory variables. For A_{bp}, in brackets we have the results of an alternative formulation of the evaluative model of known brands, A_{bp_k} = constant + A_{ad_k} + A_{ba} and for novel brands, A_{bp_u} = constant + A_{ad_u}.

The results reproduced in Table 6 clearly illustrate that the facial affective model was the weakest. Let us stress one more time, that we have here the facial expressions experienced during the first viewing of the last two ads, in order to get results based on the same number of respondents, i.e. 152, as those reported for the other models. So, $H3_{bis}$ was clearly not supported by our data.

Applying the screening procedure to the affective models led to show that:

- Positive Verbal Reactions and to a lesser extent Verbal Reaction of boredom were the best predictors of A_{ad_k}. The first variable was also statistically significant in explaining A_{bp_k}.
- Positive Verbal Reactions and Verbal Reaction of Positive Surprise were highly significant in ex-

[15] So these models are: A_{ad_k} = constant + $AVEXEL_k$ + $EXEG_k$ + ABA and A_{ad_u} = constant + $AVEXEL_u$ + $EXEG_u$.

[16] Only half the sample (those who saw an unknown ad for a known brand or for an unknown brand in the *fifth* place in the string) displayed twice facial expressions for the fifth ad.

[17] On the basis that a *t*-statistic which is valid for testing the truth of a model is not valid for testing the truth of the alternative model.

Table 6
Summary of the results for H3

R^2 of the models				
dependent variables	evaluative model (1)	verbal affective model (5)	facial affective model (6)	total affective model (7)
Known brands				
A_{ad_k}	0.403 (0.403)	0.419 [e]	0.025	0.427 [e]
A_{bp_k}	0.298 (0.302)	0.146	0.015	0.159
Unknown brands				
A_{ad_u}	0.426 (0.423)	0.505 [e]	0.021	0.520 [e]
A_{bp_u}	0.254 (0.175)	0.230	0.005	0.236

The *equality* or *superiority* of models (5) to (7) with respect to model (1) (*J*-tests) is reported by *e* or *s*.
[e] Means equivalence of the model with respect to model (1).

plaining A_{ad_u}, the first variable being also a very good predictor of A_{bp_u}.

For model (6), facial reaction of joy (at the first viewing) was significant in explaining A_{ad_k}. For A_{ad_u}, facial reaction of interest was significant in model (6).

7.4. Additional results

In this section, we will first detail the results of facial expressions displayed during the first *and* second viewing of the last two ads. Let us recall that the sixth ad (an unknown ad for a novel brand) was inverted with the fifth one (an unknown ad for a known brand) for half our subjects. Therefore, we had for each of the last two ads facial expressions displayed during a first *and* during a second viewing for 76 respondents [18].

For the known and unknown brands, three facial expressions were coded at the second viewing: joy, positive surprise and interest. These variables were added to the independent variables of models (3), (4), (6) and (7). Applying the screening procedure, detailed above, led to the following results. With A_{bp_u} as dependent variable, the screening of model (4) left facial expression of interest (FEI2) among the highly significant variables. It seems thus that interest displayed at the second viewing of the ads for the unknown brands explained the a posteriori attitude toward these brands. In other words a second viewing seems necessary to elicit facial expression of interest, among our young respondents, that led to an impact on A_{bp_u}. This is reminiscent of the 'what of it' question assigned to the second exposure by Krugman (1972).

Working with models (3), (4), (6) and (7) of A_{ad_u} and with all our respondents ($n = 152$) displaying facial expressions at the first viewing, showed that FEI1 (facial expressions of interest) was among the significant explanatory variables of models (6) and (7). So the first viewing seemed to elicit facial expressions of interest explaining — *partially* — A_{ad_u} and the second viewing elicited facial expression of interest explaining — *partially* — A_{bp_u}.

For the known brands, perhaps due to familiarization, facial expressions were never among the significant explanatory variables of A_{bp_k}. For A_{ad_k}, facial expression of joy at the first viewing (FEJ1) was significant in a total model (7) with facial expressions displayed on both viewings and thus for half our sample ($n = 76$). This non-verbal variable was also significant in model (6) (the facial affective model) applied to our 152 respondents and in the same model with facial expressions displayed on both viewings ($n = 76$).

As a second point of this section, we will report the results obtained for the first four ads of the string. Let us remember that for these ads, we had as independent variables only facial expressions displayed at the two viewings plus prior A_b for the two known brands.

For the novel brand (an unknown brand of can-

[18] In fact, as stated above, there were for ad A two unknown ads for two known brands, each of these ads seen respectively by half the subjects. So was the case for ad B (i.e., there were two unknown ads, each for two unknown brands).

dies) the R^2 between A_{ad} and the a posteriori brand attitude was 0.252, for the known brand of pencil 0.225, for Nesquick 0.199 and for the video-game (very well known by our respondents) 0.539. This set of R^2 is not in line with what is found in the extant literature *for adults* where the link between A_{ad} and A_b is greater for novel brands than for familiar brands. For these three known brands, prior A_b was a very good predictor of A_{bp} in the absence of verbal affective reactions elicited by the ads. If these results, as well as those reported above for our last two ads illustrate significant relationships between A_{ad} and A_{bp}, *they do not support H4.*

Moreover, it appeared in regression analyses evoked in the previous section that when the VAREAD are with A_{ad} in the models explaining A_{bp}, these verbal affective reactions remain significant. In order to assess that A_{ad} does not mediate the effects of the affective reaction explaining A_{bp} and according to the method of Baron and Kenny (1986) a set of three regressions were used. First, for the known brands, the (supposed) mediator (A_{ad}) was regressed on the independent variables (VAREAD). This model is the verbal affective model explaining A_{ad_k}. Then the dependent variable (A_{bp_k}) was regressed on the independent variables (VAREAD) with also significant results and finally the dependent variable (A_{bp_k}) was regressed on both the independent variable (VAREAD) and the mediator (A_{ad}). In this last regression the effect of the independent variables on the dependent variable was not significantly less than in the second equation (especially $POSVR_k$) and the supposed mediator was not significant. We did exactly the same for unknown brands with similar results except for the fact that A_{ad} remained also significant. We also tried these regressions with only the significant verbal affective reactions explaining A_{ad} and obtained the same results.

8. Discussion

This study, conducted in as naturalistic a 'setting' as possible, shows that affective reactions of children matter in assessing the effectiveness of advertising. Like previous studies (Edell and Burke, 1987; Derbaix, 1995) adding verbal affective variables to evaluative models improves the explanatory capability of these models, though more so for A_{ad} than for A_{bp}. Not surprisingly, positive verbal affective reactions elicited by the ads seem instrumental — with the evaluative judgments of the elements of execution — in shaping children's A_{ad} and A_{bp}. So, as expected with such young respondents, persuasion is not strongly mediated by message — related thinking but by peripheral mechanisms, here from an affective type. In other words, elaboration — i.e. the extent to which children think about issue-relevant arguments contained in the ads — seems low. Moreover, the power of prior A_b to predict A_{ad} for familiar brands is limited. This peripheral route to persuasion is regarded as more ephemeral than central route to persuasion (Petty and Cacioppo, 1986). Previous researches (Rossiter, 1977) indeed indicate that children's attitudes are not that stable or are not the main base of their choices (Roedder et al., 1986; Roedder-John and Lakshmi-Rahan, 1992).

As far as the impact and the use of facial expressions are concerned important things have to be underlined. Firstly, using Izard's material (especially suited to code children's facial displays) led us to implicitly adopt the categorical or classical view of emotions. This induces an underestimation of the impact of facial expressions by only coding the ones clearly corresponding to published facial counterparts of a finite number of well-separated emotions. Facial expressions vary in their degree of exemplariness. Some expressions are prototypical examples, others are intermediate examples and still others are poor examples (Russell and Bullock, 1986). So the task of the judges became increasingly complex as we move from clear signals to borderline cases, the first ones being the only ones included in our models.

Secondly, the approaches of Denzin (1984) or even the more radical behavioral ecology view of Fridlund (1994) were addressed in the design of the study, concretely leading to work one child at time. This choice has probably produced less facial displays. In a recent review Wagner and Smith (1991) showed that emotional facial expressions are facilitated by the presence of friends. As predicted by behavioral ecological theories of facial behavior (Fridlund op.cit.), some emotions are sometimes not sufficient alone for having a clear expression. They need 'the help of' interactions with others. Further

research will have to examine this issue by replicating a study like ours with at least a couple of children watching TV. However, in that case it will be impossible to attribute (only) to the ads the cause of the facial expressions.

Third, the limited impact of facial expressions can be due to inter-individual variability in the 'expressiveness' of emotion which by itself does not correlate with the intensity of 'felt emotion'. It is admitted that temperamental factors contribute to the formation of unique individual response patterns. Even if children are more spontaneous than adults, they are different in their ability to suppress, exaggerate or distort their facial expressions. In addition each child has a unique history in relation to commercials and TV watching. *The* child watching TV does not exist. To attenuate this limitation, the use of unknown ads — to test our basic hypotheses — minimizes the possibility of children entering the experimental situation with varying levels of prior exposure to the stimulus commercials.

Moreover affective reactions can be shaped by a variety of environmental events, changing contextual demands, repeated exposures and settings. An experimental situation could not be an exact analogue to a real-life situation. We believe that our laboratory setting — which enables recording close-ups of facial expressions — was closer to a movie theater than to natural in-home viewing. For children the difference between movie theater and in home-TV viewing is perhaps not that great to the extent that TV is, for them, mainly a show to which they devote real attention. So the artificiality of our setting seems limited. The situation we tried to put our young respondents in was so interesting, involving and believable, i.e. one of experimental realism. However our elicitors (the ads) were not as highly intense as others encountered in everyday settings. Whereas other fields of research are perhaps able to reproduce easily their basic processes and variables in the laboratory, it is difficult to do so for 'hot' psychological processes causing emotions equivalent to the ones experienced in natural settings. As far as limited exposure is concerned, it is quite possible that, at high exposure level, tedium or reactance is likely to develop, leading to an attack against the message and/or a decline in affect. Nevertheless, simultaneously we think that, in general, habituation is essentially positive for children (for a review see Brée, 1993). But more research is needed on the wear out pattern of children's affective reactions.

Finally, to the extent that the possibility of a shared method variance between *verbal* affective reactions and measures of A_{ad} and of A_{bp} cannot be ruled out, the limited impact of on-line emotions measured by facial expressions can be explained. So, in future research, designing non-verbal measures of *dependent* variables should be a priority.

The variety (essentially joy, interest and to a lesser extent surprise, fear, anger and disgust) and particularly the number of decoded facial expressions were less than expected with such respondents for whom few display rules should soften facial expressions. But we have to stress that our respondents have perhaps more expertise, more 'commercials' background' than their parents! In fact they spent numerous hours watching TV and commercials. Therefore it is not that easy to surprise them and/or to elicit strong affective reactions.

Additionally, an unexpected finding emerges from our research. A_{ad} does not mediate the impact of verbal affective reactions on A_{bp}. Our respondents and our pseudo-naturalistic setting offer perhaps the conditions for the manifestation of a 'superior order affect mechanism' to take place. In that case, verbal affective predictors are the dominant ones.

Finally, the results concerning facial expressions are not as disappointing as they appear at first sight. Assessment of emotions through coding facial expressions is of course demanding for the researchers but not at all for the consumers. This procedure might be taken into account when pretesting ads, especially with children whose cognitive capacities are more limited. Three examples illustrate this suggestion. Facial expressions of joy (for Kit Kat), of interest (for Nesquik), of fear and disgust (for a parlour game: 'the night of the vampires') gave measurements revealing attractive (the first two) and repulsive (the third one) ads.

9. Limitations

The above detailed findings must be tempered by a few limitations.

Our setting was designed to get uninhibited and

unmodulated facial expressions. Nevertheless our coding procedure rests on the Universality thesis which has not been definitely proven. Working with one child at a time we missed the opportunity to work in a context where emotions and facial expressions are mainly determined by social factors. Third, children do not often watch television alone in a non-home location. Fourth, single exposure is not the normal form of children's commercial experience. Finally and at a more peripheral level, all our results were achieved with the variables of Tables 1 and 2, among which some are associated with alphas which are not as high as desired.

10. Conclusion

This research shows that when children are exposed to commercials, the way they evaluate the elements of execution is a better predictor of their A_{ad} than their evaluation of the elements of argument. However, considering only this evaluative dimension was not enough to obtain a good explanation of A_{ad} and it was necessary to include affective reactions elicited by the ad. Finally, a significant relationship was found for the child between A_{ad} and A_b. So, our basic hypothetical model (see Fig. 2) is globally validated.

The other aim of the study was a methodological one, i.e. to discover the most relevant way to measure affective reactions elicited by the ad. We clearly showed that, even if not free from biases, verbal measurement outperforms the coding of facial expressions in explaining the attitudes of children toward the ad and the brand. Despite this result, it is surely premature to conclude that facial measurement comes to a deadlock. Moreover, it is perhaps a conceptual confusion to consider at the same level verbal and nonverbal (facial) measurements. In fact in this study, facial emotional expressions only concern strong (prototypical) reactions at clearly definite moments during exposure whereas verbal affective responses constitute an a posteriori global response. So these two types of measurement do not tap exactly the same construct and are not made at the same moment: one is intermittent and the other not. By estimating the emotional reactions with facial expressions we probably do not directly consider one component of the attitude toward the ad, but at best one component of the total affective reactions elicited by the ad. In that case, our facial measures would be predictors of our verbal measures, as well as our verbal measures are predictors of the children's A_{ad}. The other predictors of the global affective reactions would be milder (less prototypical) reactions (than the observed emotions) which could perhaps be measured during the exposure through physiological devices. Consequently it seems that the next step to understand the child's attitude toward the ad should be the test of the following conceptual model (see Fig. 4).

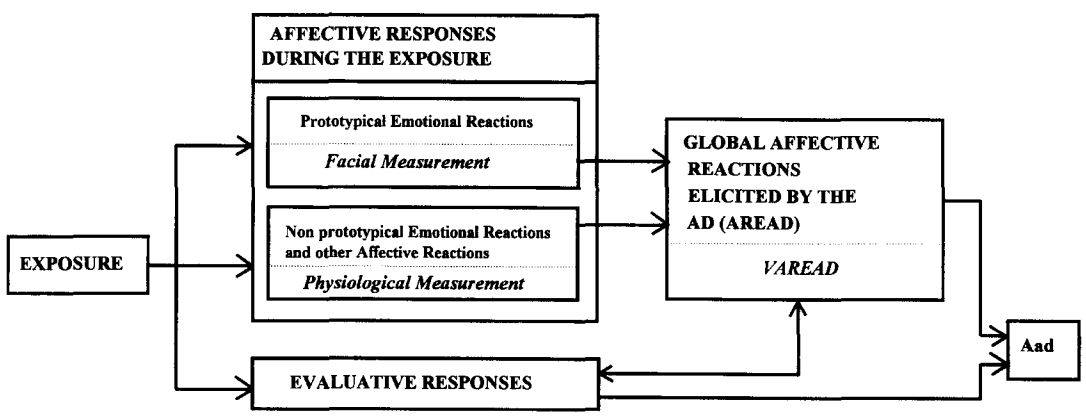

Fig. 4. Proposed conceptual model of the forming of children's A_{ad}.

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Appendix A. Testing for the significance of interaction terms involving the known / unknown dummy variable

The model with the dummy and with one predictor can be formulated as:

$$\tilde{y}_i = (\beta_0 + \gamma_0 \cdot D_i) + \beta_1 \cdot x_i + \gamma_1 (x_i \cdot D_i) + \tilde{u}_i$$

with $D_i = 1$ for known brand; $D_i = 0$ for unknown brand. If $\gamma_0 = 0$ and $\gamma_1 \neq 0$, we have a difference in slope [19]. If $\gamma_0 \neq 0$ and $\gamma_1 = 0$, we have a difference in intercept. If $\gamma_0 \neq 0$ and $\gamma_1 \neq 0$, we have a difference both in slope and intercept.

In the general case for k independent variables the model with the dummy (D) is:

$$\tilde{y}_i = \sum_{j=0}^{k} \beta_j \cdot x_{ij} + \sum_{j=0}^{k} \gamma_j (x_{ij} \cdot D_i) + \tilde{u}_i$$

with $D_i = 1$ for known brand; $D_i = 0$ for unknown brand and $x_{i,o} = 1$, for all i.

For the subsample of known brands ($D_i = 1$), we have:

$$\tilde{y}_i = \sum_{j=0}^{k} (\beta_j + \gamma_j) \cdot x_{ij} + \tilde{u}_i$$

For the subsample of unknown brands ($D_i = 0$), we have:

$$\tilde{y}_i = \sum_{j=0}^{k} \beta_j \cdot x_{ij} + \tilde{u}_i$$

[19] Note that observing a difference in slope would necessarily lead to observing a difference in the intercept.

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