A Model for Determining How the Public Interprets Print Advertisements, by Means of a Smart Questionnaire

Ciprian-Viorel Pop, Diana-Aderina Moisuc, Nela Şteliac, Anca-Petruța Nan

***Abstract*—** The efficiency of an advertisement resides in the meanings it conveys to the audience. Just like before launching a new product, preparing a new advertisement involves several rounds of testing the meanings that it transmits to the public. The validity of the meaning assessment tool is directly dependent on the interpretation theory that it is founded on. Along the lines of Relevance Theory, we believe that people filter from advertisements only what is relevant to them, i.e. whatever brings cognitive gains to them. Starting from the hypothesis that an individual's interpretation of an advertisement is traceable in the cognitive changes that the advertisement determines in the individual, we devised an expert-system aided print advertising evaluation tool which assesses the existence of cognitive effects after viewing the advertisement. Although the interface looks like a questionnaire, its functions exceed by far those of classic questionnaires, as it is designed to assign numeric values to answers, add them up selectively, provide intermediate and final scores, as well as display final reports about advertising interpretations, cognitive effects, and assumptions that might have been changed by the advertisement. The paper presents the step-by-step construction of the expert system on an Exsys Corvid platform, and discusses the results of the first survey founded on the "smart" questionnaire.

***Keywords*—** advertising, expert systems, Exsys Corvid, interpretation, marketing.

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I. Introduction

ADVERTISING is a multi-billion industry which has stopped being a complementary business operation for a long time. It has indeed become the "soul of the business", the prime source of competitive advantage of any organization [1].

Print advertisements date back to the beginnings of advertising, and still remain one of the most efficient categories. Their immediate impact is due to their ability to compress a wide array of meanings into textual and graphic elements, as well as to their extensive coverage in almost all possible media: from the press, the Internet, to posters and other external media [1] [2] [3] [4].

However, it is not enough for an advertisement to be in the media; it needs to be known by its audience in order to really exist [1] [5]. This is why advertising agencies need to make sure, prior to, during and after an advertising campaign, that their advertisements manage to catch the public's interest [3] [6].

Over the course of time, the need to evaluate advertisements at every stage has created countless evaluation tools. They are attributable not only to the continuous emergence of new technologies, but also to different stances as to what measures an individual's interpretation of the advertisement, whether it is the advertisement's words, pictures, a mixture of the two, or the individual's feelings, beliefs and/or purchase behavior.

This study is also the fruit of technological development, combined with a theoretical interpretation stance. It uses the tenets of a generic theory of human communication, Relevance Theory, applied to advertising communication, and incorporates them into an advertising interpretation questionnaire which is backed by an expert system developed in Exsys Corvid. The interpretation evaluation tool which is the outcome of this research is not only useful, but necessary for a relevant assessment of what a print advertisement means to a wide variety of individuals.

Henceforth, our paper shall discuss the different stages that led to the formation of the expert system behind the online questionnaire. Our first attempt is to explain the concept of relevance, as it stands at the core of our measurement tool. This will enable a clearer understanding of our study objectives. Afterwards, the main focus will shift to the construction of the expert system behind the questionnaire,

which will prove the achievability of the objectives.

II. Relevance and Advertisements

The question here is how an advertising evaluation tool can measure a somewhat homogeneous advertising message along so many individuals who each have their own way of interpreting it, resulting in countless heterogeneous meanings.

Meaning in advertising is determined by two factors: the creator's intentionality, on the one hand, and the reader's cognitive environment (corresponding, roughly, to her knowledge and beliefs), on the other [4] [7] [8]. Therefore, in order to take hold of the meaning of an advertisement, it is necessary to consider variations in cognitive environments, as they function as a filter for intended meaning. Our meaning measuring tool uses relevance as a fundamental concept in determining what part of meaning is filtered by individuals.

It is time to explain what relevance is, and how it is of any help to our endeavor. Every day, one is bombarded with information, which roughly falls into two categories: relevant or irrelevant (to one). One unconsciously submits every bit of information to relevance assessment and, based on it, one either pursues its interpretation (and, consequently, integrates it into one's cognitive environment), or rejects it as irrelevant. This applies to advertisements, as well: a bald man will tend to ignore an advertisement for a hair conditioner. In other words, the meaning of an advertisement for a person is only what is relevant to her and her alone.

But how can the meaning of an advertisement be rated as more relevant (to an individual) than another, and thus be considered the more likely meaning to be associated with the advertisement (by the individual in question)? According to Relevance Theory, when two meanings require the same amount of processing effort to arrive at, the richer in cognitive effects will undoubtedly be more relevant, and therefore preferred to the other [8].

So far, one can draw the conclusion that interpretations are ranked by their relevance, which is measured by the cognitive effects of the interpretation on the individual. This requires a clear description of what cognitive effects represent.

There are three types of possible cognitive effects that an assumption (or interpretation, in our case) may have on an individual's cognitive environment: contradiction, strengthening, or contextual implication [4] [8].

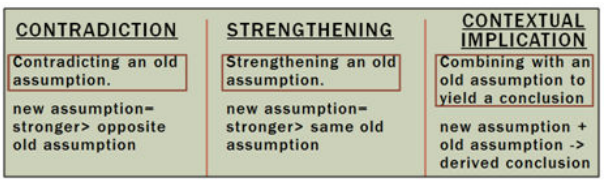


Fig. 1. The three types of cognitive effects of an assumption (Source: adapted from [8]).

For instance, a hair conditioner advertisement for a competing brand might contradict one's opinion that the product one uses is the best on the market. Or, on the contrary, it might strengthen it, so that one's new positive assumption about one's brand will be even stronger than the previous one. Or, if the person has problems when drying her hair, and the advertisement tells her that conditioner X helps in such occasions, she will derive the contextual implication that conditioner X will help her in drying her hair. However, the same advertisement lacks relevance to a bald person, as it fails to produce any cognitive effects on him.

Therefore, out of a series of possible interpretations for an advertisement, it is possible to sort out the ones which are most relevant for most individuals by assessing whether they have any cognitive effects on the individuals

III. The Questionnaire: Objectives

After laying down the theoretical grounds of the study, the attention will turn to the questionnaire proper. Next to its purpose, special attention will be allotted to the method used in devising it, as well as to the rationale behind its structure.

Our study has two main objectives:

1. to obtain interpretations of five selected print advertisements from a certain number of subjects;
2. to identify the most widespread interpretations and explain their occurrence.

The two objectives were achieved separately, dividing the study into two steps. In order to achieve the two main objectives, not one, but two questionnaires, had to be devised: a classic open-ended questionnaire (for the first objective), and a close-ended questionnaire built on an expert system (for the second objective). It is the second that stands at the core of the present paper and will be referred to hereafter as "the questionnaire"; however, some words must also be said of the means used to achieve the first objective, without which the second stage of the study could not have been reached.

A. First Objective

The semi-free questionnaire used to achieve the first objective consisted of five print advertisements, below which the subjects were asked to write their own interpretation of the advertisement.

Fig. 2. The open questionnaire used in step 1 of the study (Source: screenshot from the first questionnaire).

Following Freud's free association model in psychology, the subjects were expected to write down freely their thoughts as

they occurred; what made the task semi-free is that the subject's mind could not run freely in any direction, but only towards what is related to the advertisement.

This approach is also in accordance with the relevance-theoretic view that individuals interpret advertisements semi-freely, i.e. based partly on the advertisement and partly on their cognitive environment, deriving from it interpretations which are relevant to them [8].

B. Second Objective: The Questionnaire

In order to proceed to the second objective, it was necessary to make a selection of the most frequent interpretations in step 1, by extracting concepts from interpretations. After this first selection, it was still necessary to narrow them down, with the help of another questionnaire - the main focus of this paper. At the same time, this second questionnaire was meant to provide the necessary data to account for the individuals' preference for an interpretation over another.

1) Starting Point

The study hinges on the assumption that, other things being equal (i.e. the advertisement), the different interpretations of advertisements will be accountable by the different cognitive environments of the various interpreters. Thus, we devised a questionnaire testing assumptions which reveal aspects of the individuals' cognitive environments before (t1) and after (t2) viewing the advertisement.

The difference in the cognitive environment of an individual, reflected by the change of one of their assumptions from t1 to t2, is the result of viewing the advertisement. This is where lies the meaning that the advertisement has for that particular interpreter. Following Relevance Theory, whenever the logical structure of an assumption changes from t1 to t2, the advertisement carries a relevant assumption for the interpreter, i.e. it has some meaning for the interpreter. Moreover, the change of the assumption from t1 to t2 is the result of any of three types of cognitive effects (strengthening, contradiction, or contextual implication).

In conclusion, the difference in an assumption from t1 to t2 is what evidences the cognitive effect of the advertisement on the interpreter. Therefore, the questionnaire was expected to test three variables (the individual's assumption at t1, the very same assumption at t2, as well as the cognitive effect in hand), in order to reach its final goal, evidencing the individual's interpretation of the advertisement.

2) First Attempt

Our endeavor was marked by a first failed attempt, in the shape of a classic questionnaire, as illustrated in Fig. 3. Nevertheless, the basic concept behind it was not wrong at all: a first section identifying initial assumptions, a second section allotted to viewing the print advertisement, followed by a third section identifying any changes in the assumptions triggered by section two.

The problem was in the classic questionnaire's failure to compare questionnaire choices selectively (ex. the choice for item 1 in section 1, compared with the choice for item 1 in section 3). But even if it did manage to do that, it would still not be able to label these changes in an intelligent way as one of the three types of cognitive effects listed before. And, without these elements, it would be practically impossible to reconstruct the meaning of the advertisement out of the subject's choices in the questionnaire.

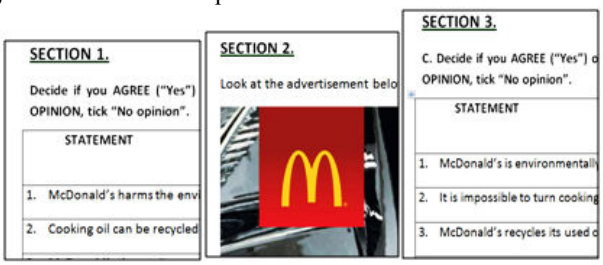


Fig 3. The classic version of the questionnaire in step 2 (Source: screenshots from the three sections of the questionnaire).

3) The Idea

Therefore, the classic version of the questionnaire had to be abandoned. The need to intelligently sort through the respondents' answers and interpret them in a smart way required a more advanced tool. We turned our attention to the domain of artificial intelligence and expert systems, which promised to offer the tool for devising a smart questionnaire. Thus, the static questionnaire had to be turned into a "smart" questionnaire with the help of an expert system. However, this did not mean abandoning the three-section structure (initial statements, the viewing section, and final statements that check any changes in the individual's cognitive environment). It is not the questionnaire structure and interface that needed changes, but the "invisible" architecture which should create links between responses, and evaluate them with respect to advertising interpretation and cognitive effects.

The objective of the expert system-aided questionnaire was to show four types of co-dependent results for every assumption in an intelligent way:

1. the interpretation of the advertisement (which determined the change in the assumption);
2. the cognitive effect (responsible for the same change);
3. the individual's initial assumption;
4. the individual's final assumption after viewing the advertisement.

For example, when the advertisement for McDonald's created a change in an individual's assumptions about the company's environmental practices, the system was expected to detect it, put a label on it (the cognitive effect), and then reconstruct the interpretation that the individual might have made of the advertisement.

IV. Designing the Expert System

Expert systems have proven highly versatile in providing solutions in a wide array of business sectors [9][10][11][12]. The reliability of their solutions is due to their ability to emulate the decision-making process of human experts in the field, as well as to the possibility to deconstruct the reasoning process that led to their decisions [9][11].

Thus, their ability to make evaluative decisions and explain them to system users recommends expert systems as solutions for turning classic questionnaires into smart ones. We opted for backing the questionnaire with an expert system that could provide to its developers the four types of results that needed to be obtained in our study.

Expert systems consist of two environments: the development environment and the consultation environment. System developers work in the development environment to build the system. System users, on the other hand, only have access to the consultation environment, i.e. a user-friendly interface displaying the different stages of the questionnaire.

In the context of our system, the roles of the two parties were somewhat different than in prototypical situations, where system users resort to expert systems to obtain advice (for instance, about the profitability of their business [12]). On the contrary, in our system the ones who need to solve a problem are not system users, but system developers. System users, on the other hand, voluntarily choose to participate in the survey, for the benefit of the research. They will not receive any feedback from their answers. Instead, the system reports back to its developers on respondent answers in a customized way. Thus, it manages to provide system developers with the solution to their problem.

In what follows, most focus will be allotted to the tasks performed in the development environment, while designing the expert system. At the end, the result of the work in the development environment will be analysed via screenshots from the consultation environment of the system.

According to Turban et al. [13], the steps to be taken in designing an expert system are the following: defining the problem, acquiring knowledge, selecting the system building tool, encoding and evaluating the system.

The recommended steps were followed closely, in a complex system building process which is described hereafter.

A. Defining the Problem to be Solved

Defining the problem involved stating what the system is intended to do, namely:

1. sort the responses of subjects,
2. evaluate them individually,
3. compare evaluations selectively, in pairs,
4. judge whether the selected advertisement has had any effects on subjects, based on these comparisons,
5. identify the most widespread interpretations of selected advertisements, based on the effects above.

Point 2 is expected to result in evaluations about the subjects' cognitive environments before and after viewing the advertisement, while their comparison (point 3) should highlight the existence or absence of cognitive effects (point 4). The first four points should all provide premisses for drawing conclusions about the subjects' interpretations of the advertisements (point 5). In other words, the projected expert system was expected to go beyond the subjects' responses in the questionnaire and quantify the effects of advertising on respondents so as to point out the most frequent interpretations of selected print advertisements.

B. Acquiring Knowledge

After it became clear what the system is intended to do, it was necessary to acquire the knowledge required prior to building the system. This involved obtaining all the data needed to build conceptual models and a complex knowledge database to be included in the system.

This is the stage at which prior knowledge was collected and formulated according to the requirements of the system. Expert systems work with situations that require solutions, and with criteria that lie at the basis of the decisions that they make. The situations that require solutions were identified based on the results of the first questionnaire, which provided a list of the most frequent interpretations of an advertisement. Three concepts were extracted from the first three interpretations on the list, constituting the basis for the problematic situations which the system was expected to solve (Fig. 4.).

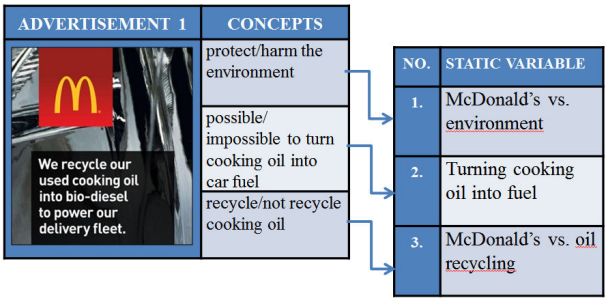


Fig. 4. The results of the first questionnaire as starting point for the expert system.

C. Encoding the System

After all the prerequisite knowledge was collected in the form of a database, it was finally time to select the system building platform and start building the system at the encoding phase. We chose to build the system on Exsys Corvid due to the ease of using, implementing, updating and maintaining these systems, as well as considering a vast history of successful applications of the Exsys Corvid platform in many economic fields [1] [10] [14] [15].

Once the platform was selected, it was time to encode the system along the syntactic forms used by Corvid. In other words, starting from the existing knowledge database, it was necessary to convert the questionnaire logic into Corvid's specific syntactic forms. This involved completing three types of operations that are specific to the platform, namely: defining variables, building logic blocks, and building command blocks.

Variables are major factors involved in solving the problem. We defined three types of variables: static, confidence, and collection variables.

Defining static variables meant setting system messages addressed to users before and after viewing the advertisements, together with response variants. In other words, we introduced into the system the questions and answers that appear on the

final user interface, in the questionnaire proper (Table I).

Table I. The static variables for the selected advertisement, with their corresponding statements from the questionnaire.

Static	Statement 1	Statement 2
McDonald's vs. environment	McDonald's harms the environment.	McDonald's is environmentally responsible.
Turning cooking oil into fuel	Cooking oil can be recycled into car fuel.	It is impossible to turn cooking oil into fuel.
McDonald's vs. oil recycling	McDonald's throws its used cooking oil into the environment.	McDonald's recycles its used cooking oil.

The statements in the "Statement 1" column are displayed consecutively prior to viewing the advertisement (in Section 1 of the questionnaire), together with the radio button alternatives "Yes", "No" and "No opinion", and are meant to check what assumptions (if any) are present in the respondent's cognitive environment with respect to the tested variable. The statements in the "Statement 2" column, on the other hand, are only displayed after viewing the advertisement, in Section 3 of the questionnaire. They are accompanied by the same three response options, and, by comparison, they enable us to determine whether viewing the advertisement triggered any cognitive changes in the respondent's cognitive environment.

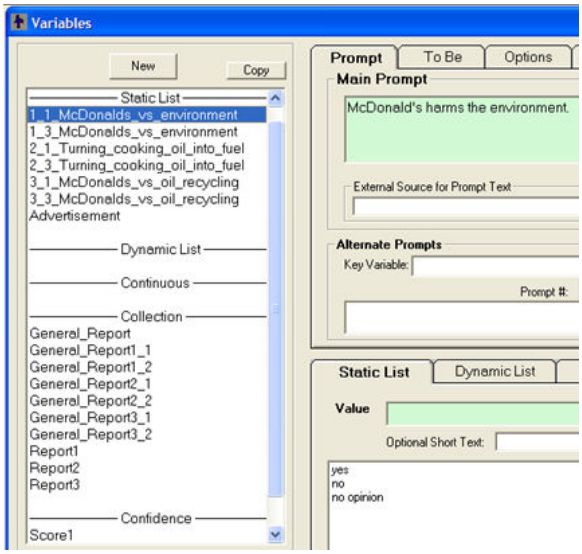


Fig. 5. System variables. (Source: Screenshot from the application, copyright Exsys Inc [16]).

The static variables were defined starting from the concepts identified in the knowledge representation phase (compare Table I with Fig. 4). The statements to be displayed to respondents had also been designed during the same phase; what was novel was that encoding these details into the system involved working in the development environment of Exsys Corvid, where each variable was defined in turn, together with the message associated with it (Fig. 5).

Confidence variables were also defined, in order to quantify system user responses. Depending on respondent answers, confidence variables would allow the system to calculate individual scores per answer and overall scores per static variable. Furthermore, collection variables were created in order to provide final system reports (Fig. 5). At this stage, we also designed the system interface by customizing the header, message display, response variants, the background, picture display etc.

Then we proceeded to the logic block, the *reasoning base of the system* [12]. It was built using the decision rules previously set in the knowledge collection and representation stage (Fig. 6).

(a)

(b)

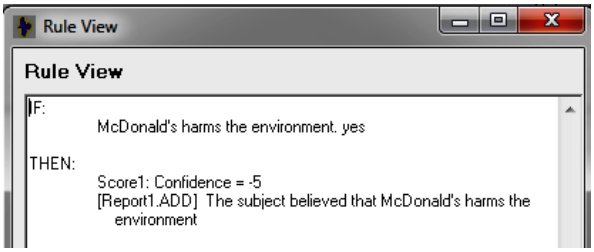


Fig.6. The system logic block. The first IF-THEN rule (Source: Application screenshot, copyright Exsys Inc [16]).

Using IF-THEN rules, we quantified each response option by assigning numeric values to confidence variables, and established the results to be displayed in the reports provided by the collection variables.

For instance, the first node in the logic block (Fig. 6) sets a condition (if the respondent answers "yes" to the message "McDonald's harms the environment") which, if fulfilled, assigns a -5 score to the confidence variable "Score 1", and determines the display of the final system report "The subject believed that McDonald's harms the environment").

Building the logic block was probably the most time-consuming stage in the system building process, as it involved reflecting on all the response variants and their possible combinations, each of which resulted in a node (a rule) in the logic block. After deciding on the condition in every rule, a significant amount of time was allotted to defining intermediate and final scores, as well as final system reports. Intermediate scores represent the score of each answer in turn, while the final scores are the numeric values of the three variables after the addition of their two intermediate scores.

The logic block is designed so that, in the end, depending on the values of the confidence variables (intermediate and final

scores), the system is able to evaluate the effect of advertising on system users (one of several types of cognitive effects-desired or undesired, or no effect), as well as the interpretation that the system user attributes to the advertisement.

Based on the possible combinations of the intermediate scores, nine possible final scores were identified for each static variable, corresponding to nine possible scenarios. The nine situations would yield specific system reports: besides information about the respondent's cognitive background before and after viewing the advertisement (ex. the message in Fig. 6), it was also necessary to define system reports about the advertising interpretation and the cognitive effect it has achieved on the interpreter.

Table II details three of the nine possible situations for the first static variable.

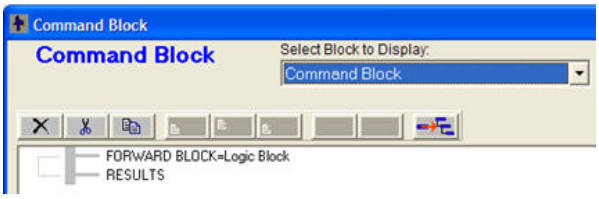
Table II. Three (of the nine) possible scenarios for the first static variable.

Intermed. scores. Final score		Interpretation of the advertisement. Cognitive effect
-5-10 Y+N	-15	- McDonald's isn't environmentally responsible. - strengthening (undesired)
-5+10 Y+Y	5	- McDonald's is environmentally responsible. - contradiction (desired)
7+10 N+Y	17	- McDonald's is environmentally responsible. - strengthening (desired)

For instance, according to the first possible scenario, if the respondent answers "Yes" to the statement "McDonald's harms the environment", her answer receives a -5 intermediate score. Furthermore, after viewing the advertisement, if she answers "No" to "McDonald's is environmentally responsible", the new answer receives a -10 intermediate score. The addition leads to the final score of -15. Whenever a respondent is assigned the final score of -15 to the first static variable, the system will provide a report saying that the respondent's interpretation of the advertisement is "McDonald's isn't environmentally responsible", and that the advertisement achieved an undesired strengthening effect.

The system design was completed by defining the command block. The command block determines how the system will interact with the user, including the order of execution and the final interface of the results generated by the system.

(a)



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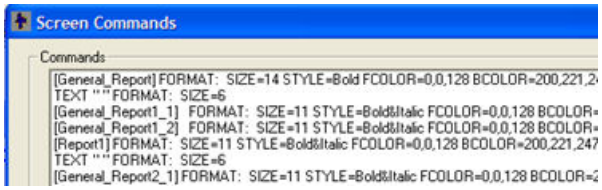

Fig. 7. The system command block. (Source: Application screenshots, copyright Exsys Inc [16]).

D. *Evaluating the System*

Evaluating the system included verifying and validating the system.

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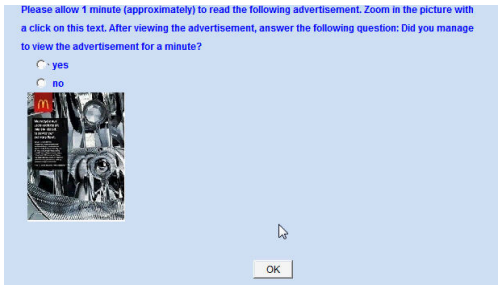

(c)

Fig. 8. The three sections of the online questionnaire. Screenshots while running the application, copyright Exsys Inc [16].

Verifying ensures that the knowledge database contains all the acquired data and that there are no errors in the encoding stage. The first phase of the process, verifying, supposed a minute analysis of the architecture of the system. We checked that the static variables were associated with the right statements and the right three variants of answers, and that there were no typing errors either. Furthermore, it was necessary to analyze minutely every one of the 150 nodes of the expert system. Every node was analyzed according to the IF-THEN rule that it contains, making sure that not only the conditions are correct, but also the scores and the reports

attached to them. The accuracy of the reports was also under scrutiny at this stage.

Moreover, it was also necessary to make sure that individual responses were correctly quantified, in terms of scores and reports about cognitive environments. In order to do so, we filled in the questionnaire several times, using predefined answers that were supposed to trigger fixed final system reports. This enabled us to make sure that the actual system reports were in accordance with what our predefined answers were supposed to lead to.

Thus, the verifying phase was completed after checking variables and the rules (with their scores and reports) in the logic block. But verifying was only the first phase of the process of system evaluation. It was followed by the validating phase, which was expected to test whether the system was able to solve the submitted problem correctly.

The first stage of the validating process involved running the advertising-evaluation expert system, making sure that all the three sections of the questionnaire are displayed appropriately (Fig. 8).

Running the system also enabled us to conclude that, after completing the questionnaire, the system displays an easy-to-use, user friendly interface, consisting of the results. The system is able to sort and interpret user responses, providing thus the four sets of results which we need for a relevance-theoretic interpretation of print advertisements.

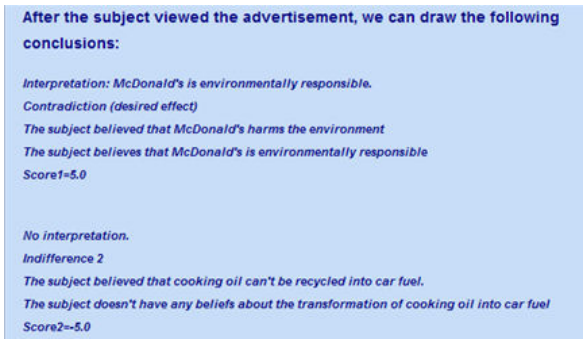

Fig. 9. The results after filling in the questionnaire. Screenshot while running the application, copyright Exsys Inc [16].

V. Results

The questionnaire was applied on 38 subjects with at least an intermediate English level. The system reports for each respondent enabled us to identify the most frequent interpretations of the advertisement, and then further explain them in terms of cognitive effects.

Fig. 10 presents the most frequent interpretations of the advertisement, as revealed by the expert-system aided advertising interpretation questionnaire.

The two most frequent interpretations are very close in terms of frequency. "It is possible to turn cooking oil into fuel" is the most frequent (28.07%) probably because it is presupposed by the main message of the advertisement: if it is true that McDonald's recycles its used cooking oil to power its delivery fleet (the text of the advertisement after reference assignment), than it is necessarily true that it is possible to turn cooking oil into fuel.

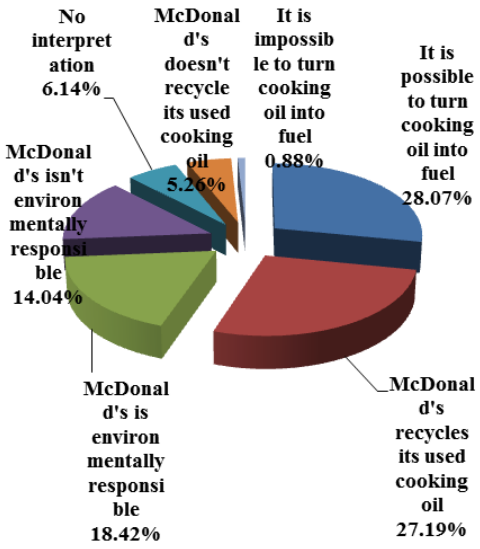

Fig. 10. The most frequent interpretations of the advertisement, by percentage.

The second interpretation, only 1% short of being the most frequent (27.19%), is "McDonald's recycles its used cooking oil". The high frequency of this interpretation is accountable by the fact that the assumption can be directly derived from the text of the advertisement after completing reference assignment (when "We recycle our used cooking oil…" becomes "McDonald's recycles its used cooking oil…"). This proves that the advertisement manages to persuade the possible customer of the validity of the message presupposed by the text of the advertisement.

It is now time to take the two most frequent interpretations and check the advertisement's cognitive effects on respondents (Fig. 11).

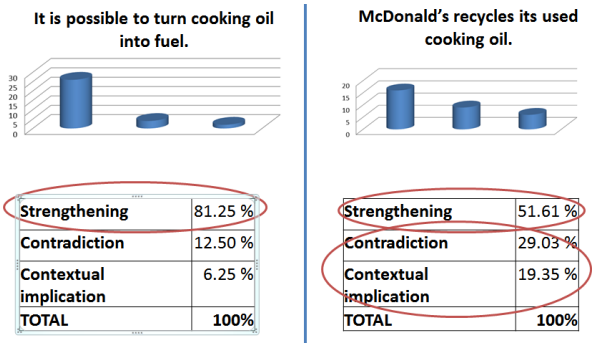

Fig. 11. The cognitive effects of the two most frequent interpretations.

Strengthening accounts for more than 50% of the effects of both interpretations, thus being by far the most frequent effect of the advertisement. If this were to be turned into a general rule (after testing, of course, on many more other advertisements), one would have to say that the most frequent interpretation produces mainly strengthening effects.

When comparing the frequency of strengthening effects between interpretations, one can notice that the ratio of strengthening effects is highest (81.25%) for the first interpretation. In other words, there was very little controversy about the possibility of recycling cooking oil into fuel, as most respondent assumed it was possible both before and after viewing the advertisement.

The situation changes significantly for the second interpretation, where strengthening accounts for only half of the advertisement's effects on target customers. The other half is represented by contradiction and contextual implication, of which, significantly enough, contradiction is the most frequent. Nearly one third of the respondents (29.03%) believed that McDonald's doesn't recycle its used cooking oil, before viewing the advertisement, and managed to change this assumption in the other direction as a result of seeing the advertisement. Thus, the advertisement achieved desired contradiction effects on almost a third of the respondents who made the second interpretation. This proves the efficiency of the advertisement in persuading even people who believe the opposite to what the advertisement says to them.

VI. Conclusions

An expert system was the right solution due to the appealing interface it establishes with the survey respondent, and owing to its intelligent way of adding up selectively response numeric values and providing consistent interpretations. The system was able to integrate tasks which in a classic questionnaire would have required days of statistic work. Moreover, it was able to create inner connections between responses depending on system user responses: once the user answers two questions that are linked in the system, the numeric values of their answers are added up instantaneously.

The expert system was built on the Exsys Corvid platform, by defining static, confidence and collection variables, as well as the logic block and the command block. Most of our contribution was in the definition of the three static variables (together with the corresponding user messages), as well as the establishment of numeric values for individual answers, leading to intermediate and final scores which would automatically trigger final reports.

On the functional side, our expert-system aided print advertisement evaluation tool is able to obtain four results (i.e. four interpretations of the user's responses):

1. the user's initial assumption,
2. the user's assumption after viewing the advertisement,
3. the cognitive effect responsible for the change in the assumption,
4. the user's interpretation of the advertisement, the most important result at hand.

The application of the questionnaire on 38 subjects enabled us to conclude that the McDonald's print advertisement saying "We recycle our used cooking oil into bio-diesel to power our delivery fleet" has managed to convince nearly 30% of respondents (one of the highest percentages) that McDonald's recycles its used cooking oil. Simple as such a result may seem, it is actually rare for an advertisement to manage to convey the desired meaning to the bulk of its audience.

What is even more surprising, though, and which undoubtedly vouches for the efficiency of the advertisement, is that around 30% of the subjects holding the previously mentioned view considered before viewing the advertisement that McDonald's harms the environment. In other words, the advertisement managed to contradict previous assumptions and direct its audience on the path that the advertiser wanted them to follow.

In order to be able to further exploit statistics and draw more general conclusions, it will be necessary in the future to expand the number of respondents and make sure that there is sufficient variation as to age, sex, culture, and social background. Moreover, the task still remains to find an efficient result centralizing, storing and exporting tool.

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