"Surprises" in Food Confectionary: Cognitive and Emotional Effects on the Child

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Abstract: The aim of this work is to analyze the role of the "surprise" in marketing food (SMF), with particular attention to the cognitive and emotional processes that can be elicited by these toys. Usually, the advertising messages induce people to believe that an emotion of surprise is really related to the SMF. Our main questions are: could an object found in a food-product really elicit an emotion of surprise? What happens in children's emotional and cognitive processes when they open a SMF? To answer to these questions, starting from the appraisal theories and elaborating the model of surprise of Meyer, Reisenzein, & Schützwohl [1], we have proposed an alternative model on the possible cognitive and emotional processes that are elicited by the SMF. Under this model, it is hypothesized that there are some high arousal positive emotions that come first during the "see phase", and that are matched with specific expectations of the child. During the "open phase", these positive emotions can reach the intensity and arousal peak if there is congruence between the child expectations and the SMF. On the contrary, if there is a discrepancy, the valence of these emotions changes. Finally, during the "play phase", in a "congruence condition" the child probably plays with the toy experiencing positive emotions. In a "discrepancy condition" instead, if the child find something better compared to what she/he thought then positive emotions emerge before and during the play phase, while if the child find something worst, then very probability she/he do not play with the toy and some negative emotions or a neutral state (like indifference) could be present.

Keywords: Playing, emotion, toys with food, cognitive function child.

THE DEFINITION OF "SURPRISE" IN MARKETING FOOD (SMF)

A particular area where the term "surprise" is widely used is in the marketing of food, some interesting papers on the use of surprise as a marketing tool [2-4]. Generally, to increase the motivation to buy a product the companies insert an object called "surprise" inside the food-package. The primary use of SMF is for advertising purposes, in which case the SMF are promoting messages aimed at inducing people to believe that if you buy this, you or your children will be happy for a variety of reasons: a new toy to play with, a new delicious flavor to taste and for the parents, the smiling face of their child [5, 6]. By doing this, they show smiling people while they are eating or playing with the "surprises". Moreover, in some advertising messages there is also a play with the words, the facial expressions and the emotions. They call "surprise" the object given with the package, but they also can insert this term in the name of the product and they can help people to believe that this "surprise" provokes an emotion of surprise when children open the package, showing children characterized by the typical facial expression of surprise.

A more sophisticated and perhaps unique case of SMF are chocolate eggs, in which the surprise is so important that it becomes ontologically non separable from the envelope (the chocolate egg) containing it. This ends up in much more than a marketing strategy, defining at the very end a class of products which are combining chocolate and toys in one product, which has been proven to be safe for children and well understood by parents [7, 8].

This paper is aimed at addressing some aspects which are relatively unexplored in regard to SMF: could an object found in a food-product really elicit an emotion of surprise, at least such that the definition of "surprise" would turn out to be appropriate? If not, what happens in children's emotional and cognitive processes when he or she opens an SMF and how can we characterize this experience in psychological terms?

First of all, a definition of the emotion of surprise and a deepening on its nature is offered. Starting from the appraisal theories, it has been verified if the surprise is really the more appropriate emotion to take in consideration when a child opens a SMF. Second, we proposed an analysis of the emo-

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tional aspects that characterized the opening phase of the SFM and an analysis of the cognitive and emotional processes activated during the interaction with these toys.

THE EMOTION OF SURPRISE

The emotion of surprise consists of a sharp increase in neutral situation, typically brought about by a sudden unexpected event [9]. Surprise is always a transient state and it serves the very useful function of clearing the nervous system of ongoing emotion and cognition, so that the individual can respond appropriately both to the stimulus situation and the sudden change he has experienced [9]. It is as though ordinary thought processes are temporarily stopped and there is a feeling of uncertainty resulted from the sudden unexpected event.

Table 1. The Syndrome of Surprise (*Modified from [2, 3]*)

Behavioral Level
- Specific facial expressions - Interruption of on-going activities - Sudden and involuntary focusing on the surprising product/service/attribute - Heightened consciousness of the surprising product/service/attribute - Subsequent curiosity or exploratory behavior - Increase in the ability to retain in memory the surprising product/service/attribute
Physiological Level
- Changes in heart and respiration rates - Increase in skin conductivity and neural activation - Different cortical response wave patterns (P300)
Verbal/Subjective Level
- Subjective feeling of surprise - Spontaneous vocalizations

The emotion of surprise can be conceptualized as a syndrome of reactions involving a subjective feeling of surprise, physiological (e.g. increase in the skin conductance), verbal and behavioral levels, as the Table **1** reports [1,10,11,13].

Specifically, at behavioral level the surprise facial expression is one of the easier to recognize syndrome reactions. Usually, the brow is lifted, creating wrinkles across the forehead; the eyebrows are raised, giving the eyes a large, rounded appearance; the mouth is opened in an oval shape [9, 12].

The facial expression of this emotion emerges only after 8 months, when infant has developed the concept of object permanence and can distinguish between expected and unexpected outcomes [13, 14]. Moreover, the conditions under which to show appropriate expressions of emotion are learned in the process of development [13, 15-17].

The Nature of the Emotion of Surprise

Contemporary emotion theorists broadly agree that emotions are elicited by and can be differentiated in terms of cognitive appraisal of situations and events [18-23]. Appraisal theories of emotion propose that emotions come from subjective evaluations of events: people appraise an event's meaning, and these appraisals bring about emotions [24]. According to this appraisal-based component process model, an interesting information processing model of surprise has been proposed by Meyer, Reisenzein, & Schützwohl [1]. This cognitive-psycho-evolutionary model of surprise is concerned with the mental processes elicited by surprising events (see Fig. **3**).

According to Mandler [25], Rumelhart [26], and Taylor & Croclker [27], Meyer *et al.* [1] assume that perception, thought, and action are to a large extent controlled by complex knowledge structures named *schemata*, which can be regarded as informal, unarticulated theories about objects, situations, and events. From this theoretic framework, the authors develop a model of processes elicited by surprising events. They assume that when there is congruence between activated schemata and the events that are encountered, the interpretation of these events and the execution of appropriate actions run off in a largely automatic way. In contrast, when a discrepancy between schema and event is detected, surprise is elicited, schematic processing is interrupted, and more effortful, conscious, and deliberate analysis of the unexpected event is initiated. In other words, it is assumed that surprise-eliciting events initiate a series of mental processes that start with the appraisal of a cognized event as exceeding some threshold value of schema-discrepancy (or unexpectedness), continue with the interruption of ongoing information processing and the reallocation of processing resources to the schema-discrepant event and, simultaneously, the occurrence of a surprise experience (see Fig. **1**, points I and II), and culminate in an analysis and evaluation of this event (see Fig. **1**, point III) plus, if deemed necessary, an updating, extension, or revision of the relevant schema (see Fig. **1**, point IV) [1,28-32].

In particular, the analysis and evaluation of surprising events can comprise the following sub-processes (see Fig. **1**, point III): (*i*) the verification of the schema discrepancy (which consists of making sure that an apparent schema-discrepancy really obtains); (*ii*) the analysis of the causes of the unexpected event; (*iii*) the evaluation of the unexpected event's significance for well-being; 4. the assessment of its relevance for ongoing action [1]. In particular, after the results of the well-being check and the causal analysis, the function of the last sub-process, that is the action-relevance check, is to determine whether, in view of the surprising event, one can and should proceed with the interrupted activity, *versus* whether this activity must or should be modified or even entirely suspended, because it has become impossible to execute or because a more urgent action is called for [1].

Finally, as a result of the evaluation of the pleasantness or unpleasantness of the experience (subsequent to the evaluation of the schema discrepancy), the emotion of surprise is often followed by another emotion that colors it positively or negatively [2, 33]. People in fact talk about good/pleasant surprise (surprise + joy) and bad/unpleasant surprise (surprise + anger). Surprise is also characterized by its ability to amplify subsequent affective reactions [13].

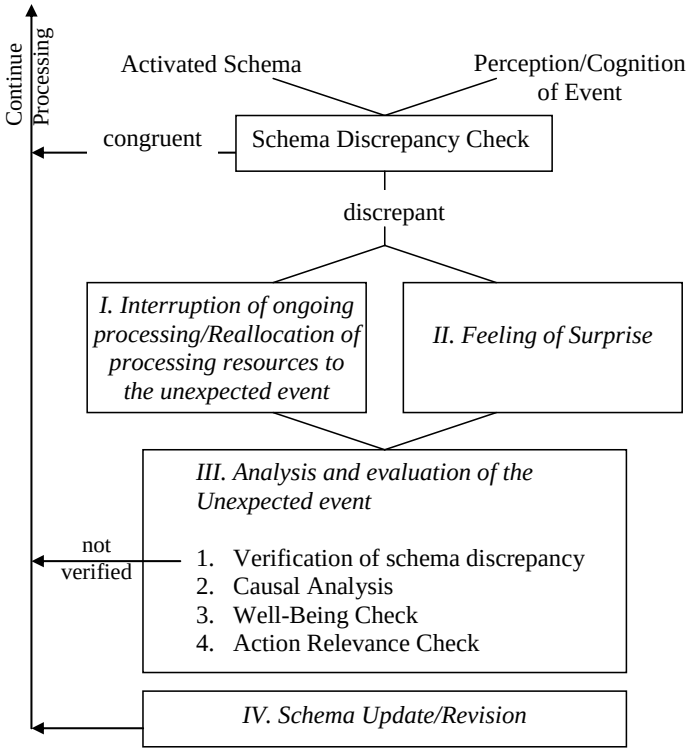

Fig. (1). Processes elicited by unexpected events (*Modified from* [1], *p. 254*).

EMOTIONS AND COGNITIVE PROCESSES ELICITED BY THE SMF

At this point a fundamental prerequisite for talking about the emotion of surprise is clearly emerged: the unexpectedness. Without this element, this emotion does not exist.

Does the SMF utilize this element? To answer to this question, the distinction must be made from the case when the toy in the food is made known to the child before opening the SMF or the case when the object is a toy (which is known by the child) but not exactly indicated a priori in the claims.

In the first case, the answer is negative. Generally, when a child opens a food-package, he/she knows that there will be an object or a toy, and in the majority of the cases, the child knows what he/she will find. To know what will be the surprise, it is sufficient to see the advertising message on television or on the package (see Fig. **2**).

Usually, the food companies choose to communicate what the surprise could be, in order to motivate children to

Fig. (2). Examples of food products that show what the child can find inside.

Fig. (3). Examples of infants' interest expression. (*For images, thanks to: www.sxc.hu*).

buy the product specifically for the toys. The food companies in fact tend to create different categories of collectable objects that are linked to a popular big name (characters). For example, the surprises often portray the protagonists of a famous cartoon (e.g., Ice Age, Shrek, Mutant Ninja Turtles). So children usually want to complete their collection and, for that reason, they are further motivated to buy a product that they know it will probably contain their desired toy. In this case it is really implausible to talk of "unexpectedness". Considering that the majority of the "surprises" inside the food-packages are advertised, it possible to infer that this kind of "surprises" do not provoke the emotion of surprise.

In the second case, when the toy is not known a priori it is possible to talk about "unexpectedness". In this case, the SMF could elicit an emotion of surprise. Obviously, the emotional state is neutral because the child does not know if the toy will be a beautiful or a boring thing. Anyway, the situation of unexpectedness, could be the antecedent of an emotion of surprise, and consequently of different positive or negative emotions that vary on the basis of the nature of the toy.

Taking into consideration the appraisal theories and, in particular, the model of surprise proposed by Meyer *et al.,* [1], it is plausible to assume that when a child sees a food package with the message or picture related to the SMF, the first emotion exhibited probably is interest (or curiosity) [34-37]. Interest is an emotion related to exploration, attention, and learning [34,38], and, specifically, it has clear motivational and goal components, particularly for exploration, information seeking, and learning (see [39-41]).

Silvia [42] reports that interest's physiological and expressive components are associated with orientation, activation, concentration, and approach-oriented action (see Fig. **3**) [43]. It involves movements of muscles in the forehead and eyes that are typical of attention and concentration [43-45]. Interest's vocal expression involves a faster rate of speech and greater range in vocal frequency [46].

Silvia [38, 42, 47] suggests that interest comes from two appraisals: an evaluation of an event's novelty–complexity and an evaluation of an event's comprehensibility. Appraisal theories would label this second appraisal a coping-potential appraisal because it involves people considering whether they have the skills, knowledge, and resources to deal with an event [24,42]. In short, if people appraise an event as new and as comprehensible, then they will find it interesting [42]. Second, when a child opens the package and sees the SMF, it is plausible to assume that a schema discrepancy check phase is activated during with his/her schemata related to the SMF are monitored (in respect to their compatibility with the available data). If there is congruence between the activated schemata and the SMF, positive emotions are elicited, such

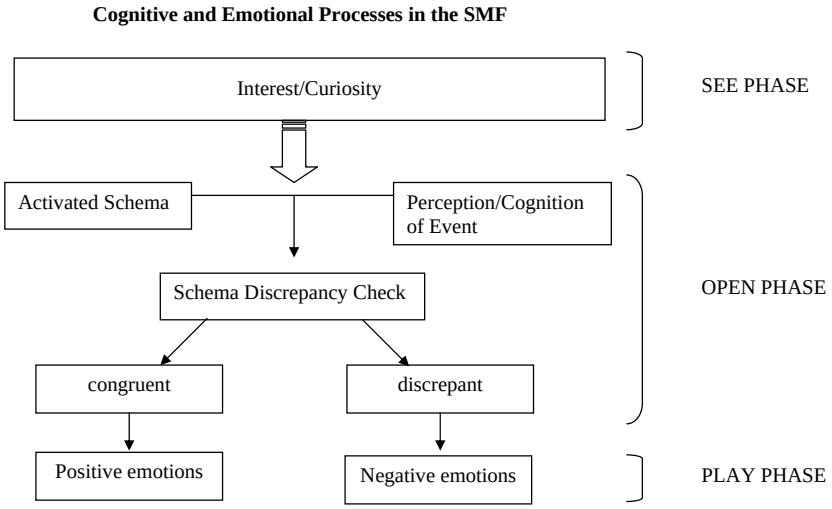

Fig. (4). Possible emotional and cognitive processes elicited by the SMF.

as happiness. Interest continues to be activated, and there is an increase of the arousal. On the contrary, if a discrepancy between schemata and SMF is detected (expectancy-violating event), different negative emotions can be elicited, such as sadness, indifference, anger. There is a decrease or increase (depending on which emotion is elicited) of the arousal (see Fig. **4**).

At this point, an interesting question could be: Is it possible (and where) to insert in this model the emotion of surprise? According to Meyer *et al.,* [1] the emotion of surprise must emerge in a discrepancy situation. Thinking about the discrepant situations displayed in Fig. (**1**), the SMF principally does not satisfy the child's expectations and for this reason, it could provoke negative emotions. In some cases, however, it is possible that the object found in the food package is really unexpected and a fantastic thing for the child, and so it is possible to talk about surprise. In this case the emotion of surprise obviously is not part of the negative emotions, because surprise itself usually is not defined by a positive or negative value [19].

Cognitive and Learning Processes Related to SMF

Once a child sees the SMF, different cognitive and emotional processes will be activated as was briefly describe above. Scherer [21, 48, 49] suggests a set of criteria, called stimulus evaluation checks (SECs), that are predicted to underlie the assessment of the significance of a stimulus event for an organism. The SECs are organized in terms of four appraisal objectives that concern the major types or classes of information with respect to an object or event that an organism requires in order to prepare an appropriate reaction, that are:

1. *Relevance*: how relevant is this event for me? Does it directly affect me or my social reference group? The detection of stimulus characteristics requires attention deployment and further information processing.
2. *Implications*: what are the implications or consequences of this event and how do these affect my well-being and my immediate or long-term goals? Assessment of the significance of the event for the organism's goals and needs.
3. *Coping potential*: how well can I cope with or adjust to these consequences? Determination of the available coping potential.
4. *Normative significance*: what is the significance of this event with respect to my self-concept and to social norms and values? Evaluation of the normative significance of the event and its aftermath for the self and its social surround.

This potential architecture of the appraisal process (see Fig. **5**; [49]) could work also for the SMF. The child checks the relevance of the surprise, its implications (for example, with this object the child can complete his/her collection or he/she can exchange it with other children in order to obtain another surprise object), his/her coping potential (for example, his/her skills to assemble a toy) and, finally, the normative significance of the SMF (for example, the child could boast of his game with others children, or could be proud of showing to his parents or friends how clever he/she is in the cognitive and/or manual skills that are required by the game).

To understand better the cognitive processes that are related to SMF, it is important also to take in consideration two variables: what kind of surprise the child finds and the child's age. Making a distinction between different kinds of surprises is the first step.

There are simple surprise objects like picture cards, objects for the school (penknives, erasers …), pendants, or cars that only need small labels on the doors or on the windshield wiper, or characters (famous or not) divided in two or more pieces that are very simple to assemble (see Fig. **6**).

Then there are complex or cognitively interesting surprises, like something complex to assemble where you have to follow the instructions to have the final game, crosswords, puzzles or team games that you have to understand, learn and then you can play with that (see Fig. **6**).

The first type of surprises usually are those that are worn, attached, put aside, put with other surprises or played with (for example, in the case of the small cars). All these activities do not require an important use of high cognitive skills, but they could require only the use of some basic cognitive processes, such as the attention and manual skills where you have to attach or put together two pieces of an object.

On the contrary, the second type of surprises, that are the cognitively interesting objects, requires high cognitive skills, in addition to attention (exploration), such as the understanding of the instruction, learning the game rules and using reasoning (logical strategies) to win.

Another consideration to keep in mind is that these two types of surprises are appreciated in different ways by children, depending on their age. In fact, young children appreciate better the simple surprises, because they are more

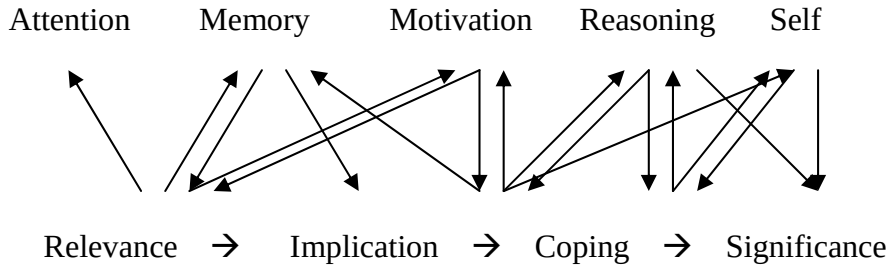

Fig. (5). Afferent and efferent links of the elements in the appraisal process with the associated cognitive structures. (*Modified from Scherer, 2001, p. 100*).

Fig. (6). Examples of a simple surprise *vs*. a cognitively complex surprise.

suitable for their age. For example, a crossword puzzle for a five-year-old child is not as interesting as a little car, because he/she has not yet developed the cognitive skills for playing with it. On the contrary, a ten-year-old child would find the puzzle interesting and the car boring.

Emotional Aspects Related to SMF

Some emotional aspects related to the SMF have already been referred to. The emotional component obviously influences all the phases that characterize the SMF. In particular, it is possible to hypothesize (in line with the model presented in Fig. **4**) that there are some high arousal positive emotions that come first during the "see phase", and that are matched with specific expectations of the child. During the "open phase", these positive emotions can reach the intensity and arousal peak if there is congruence between the child expectations and the SMF. On the contrary, if there is a discrepancy, the valence of these emotions changes. Finally, during the "play phase", in a "congruence condition" the child probably plays with the toy experiencing positive emotions. In a "discrepancy condition" instead, if the child find something better compared to what she/he thought then positive emotions emerge before and during the play phase, while if the child find something worst, then very probability she/he do not play with the toy and some negative emotions or a neutral state (like indifference) could be present. These processes are reported in a schematic way in Table **2**.

Table 2. The Main Cognitive and Emotional Processes Elicited by the SMF

Phases		Main Cognitive Processes	Main Emotional Processes
See phase		Perception of the event: Attention	Interest/curiosity; Positive emotions
Open phase		Schema discrepancy check: Attention (Exploration); Memory	Interest/curiosity
Play phase	Play	Attention, Memory, Language, Logical processes…	Positive emotions: interest, joy, surprise
	Not play	Language, Memory	Negative emotions: sadness, anger, disgust Neutral: indifference

DISCUSSION

It is very surprising how the SMF, that is basically nothing but a toy, can provoke different emotional and cognitive conditions. These "surprises", how they are called, are actually emotional and cognitive stimuli. In particular, they interact with the existing expectations of the child and with her/his emotional system and cognitive processes. In this paper, we deepened mainly the role of the emotions of surprise and interest during the discovering of the SMF. Moreover, starting from the appraisal theories and elaborating the model written by Meyer *et al.,* [1], we have proposed a new model on the possible cognitive and emotional processes that are elicited by the SMF. We think that the congruence or the discrepancy between the child's activated schemata and the SMF, could bring the child to feel different emotions and to start up various cognitive processes. Besides, all can change on the basis of two factors: the children age and the type of the SMF. We reported, in fact, that children can discover different kind of SMF and they can react in a different way on the basis of the discovered object but also on the basis of their age.

It will be very interesting to go in depth with these processes and, in particular, to study if and how they change during the child's development. Specifically, for future research after having better categorized the different types of SMF, it would be interesting to, giving one surprise for each type of the categorized SMF to children at different ages, manipulate children's expectations and analyse the behavioral (cognitive) reactions when children find congruent/discrepant and unexpected events. In this way, it would be possible to verify the absence or not of the emotion of surprise in the SMF and to study the developmental changes in the child behavior related to the SMF. Finally, further investigations on the children's play behavior with the SFM could improve our knowledge on the cognitive skills required by the SMF and the emotional reactions exhibited during these play situations. These investigations could also help the food companies to individuate better SMF that can elicit more positive emotions in children at all ages, and more intriguing cognitive processes in older children.

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