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# Music and Memory in Advertising

Music as a Device of Implicit Learning and Recall

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Music may play several roles and have many effects in advertising; it may attract attention, carry the product message, act as a mnemonic device, and create excitement or a state of relaxation. In this paper, the role of music within advertising is evaluated during low-attention conditions. The current experiment was carried out whereby participants were exposed to an advert that was embedded into a sequence of three other adverts, presented in the middle of an engaging TV programme, thus replicating natural conditions. There were four audio conditions examined in an example advertisement: jingle, instrumental music, instrumental music with voiceover and environmental sounds with voiceover, all four containing identical verbal information. The duration of the target advert was approximately 45 secs.

Results indicate that music is effective in facilitating both implicit learning and recall of the advertised product, showing that, under non-attentive conditions, there appears to be a certain mechanism of unconscious elaboration of the musical signal. The role of previous musical training of the participants was shown to have little significance.

**Keywords** Memory, implicit, music, advertising

## Introduction

Based on the blueprints of film music theory, the musical element in a commercial TV spot reinforces or directs the viewer's attention towards the elements that the advertiser wants to emphasise. Music in TV commercials, as in film, may be considered semantically a *collaborative sign*,<sup>1</sup> since it reinforces the meaning of what is depicted and also has a secondary attentive role, since the focus of the viewer's attention is on the visual track. The music reinforcing an advertising spot could be considered semantically either as *index* – music initially unfamiliar to the audience functioning as index of the advertising spot – or *symbol-index*<sup>2</sup> – music familiar to the audience, composed for another social or cultural purpose and appropriated for its commercial use.

Music may play several roles and have many effects in advertising: it may attract attention, carry the product message, act as a mnemonic device, and create excitement or a state of relaxation. Music functions, not only semantically but also in the viewer's memory, as an index of the advertising spot. 'Music can function wonderfully well as a retrieval cue. While music is frequently used in commercials it appears surprisingly rarely as a deliberate constant across campaigns' (Sutherland & Sylvester 2000, p. 216). Zaltman's statement on the primary aim of ad campaigns could be combined usefully here with this role of music as retrieval cue: 'Ad campaigns aim to facilitate a consumer's storage and recall of the feelings and thoughts associated with the product' (2003, p. 166). The role of consumers' cognition is taken seriously by marketers and creatives within the commercial field. 'An advertisement – any advertisement – has a very difficult task if it is to capture the perception of a consumer and an even harder time, once perceived, to make a net addition to what the consumer already knows about the brand.' (Weilbacher 2003, p. 232)

In the case of TV advertising, the viewer's 'focusing attention' is presumed to be a prerequisite for the elaborative encoding necessary to integrate the commercial's message with the viewer's long-term knowledge store such that it might explicitly influence subsequent perceptions, feelings, thoughts and actions (Weilbacher 2003).

What Weilbacher terms 'the viewer's focusing attention' refers to the mechanisms of explicit memory. The distinction between explicit and implicit memory is an important one and although there has been some discrepancy in the literature about how the terms are used, it essentially refers to the way in which information is retrieved. Schacter (1987) defined explicit memory as being 'revealed when performance on a task requires conscious recollection of previous experiences' and stated that implicit memory is 'revealed when previous experiences facilitate

<sup>1</sup> Elsewhere (Alexomanolaki 2006) I make a semiotic dichotomy of musical sign into *autonomous musical sign* and *collaborative musical sign*; the former occurs when music – either instrumental or vocal – is initially created and usually performed without reinforcing any kind of visual activities, while the latter occurs when a visual activity is connected to the musical – either instrumental or vocal – sign (for example, with moving images or dance in performance).

<sup>2</sup> These are broadly Peircean uses of the semiotic terms *index* and *symbol*.

performance on a task that does not require conscious or intentional recollection of previous experiences.’ Something that is explicitly recalled is therefore done so deliberately and consciously, and is said to be ‘cognitively controlled’ (Dowling et al. 2001).

Implicit memory, on the other hand, refers to the unconscious effect that a previous experience may have on our perceptual, motor, and cognitive behaviour; many implicit memories are memories of muscular acts, which have no language component (Parkin 2000). The phenomenon of implicit skill memory is perhaps the most characteristic example of this kind of memory: for example, one may know how to produce a clear tone on an instrument, but not be able to explain to anyone else how to do it (Snyder 2000, p. 73). Something that is implicitly learned is done so without deliberate or conscious reference to what is being learned. Many kinds of emotional memories, for example, appear to be implicit (LeDoux 1998, p. 201).

When a piece of information is perceived, it stays in our short-term memory for the average of 3–5 secs and, unless rehearsed, it is then forgotten (Parkin 1987). When we store the information in our long-term memory, the information is then liable to certain elaborations that lead to ‘perceptual categorization’ of the sounds we have heard or of the images we have seen (Snyder 2000), and then it is organized into groups of events with similar features, such as being close together in time, frequency, timbre, and so on. The procedure described above does not require a conscious elaboration of the information, and these are the characteristics of *bottom-up* or *data-driven* processing (Snyder 2000, Clarke 2005). ‘Bottom-up processing is based on sensory experience, as opposed to being memory driven.’ (Snyder 2000, p. 21) The type of processing which demands a higher level processing with the involvement of long-term memory, thus the ‘top’ (long-term memory) of the cognitive system, and is referred to as *top-down* or *concept-driven* processing (Snyder 2000, Clarke 2005).

In nature decisions are influenced by both explicit and implicit memories. There is evidence that implicit memory mechanisms are more closely linked with the musical component in the case of films (Boltz et al. 1991, Kalinak 1992, Cohen 2001) and advertisements (Yalch 1991, Stewart 1998). Therefore, music and sound are not used in advertising merely because the medium of television allows this as an extra option. Rather, it appears that while the image may serve primarily to attract attention and enhance explicit recognition, elaboration, association, learning and recall of the advertised product, soundtracks may play a bigger part in influencing memories and associations in a more implicit manner via a priming mechanism.

So, how significant are the elements of advertisements that are encoded at a more implicit level? Marketing research has shown that unconscious reactions to marketing stimuli are more accurate indicators of actual thought and subsequent behaviour than the conscious reports consumers often provide (Shapiro & Shanker 2001, Zaltman 2003). 'The crucial challenge for advertising, and all sponsored marketing communications about brands, is what consumers can be made to learn about the brand that transcends its transactional qualities.' (Weilbacher 2003, p. 234)

Early studies of Krishnan & Shapiro (1996) revealed that implicit memory effects are contingent on a minimum level of processing and also suggested that marketers should consider the role of implicit memory when assessing effectiveness of a brand name or an ad campaign. A later study by Shapiro & Shanker (2001, p. 10) supported this: 'In the same condition in which explicit memory retrieval failed [...], implicit memory retrieval led to an increased likelihood of choosing the target brands.' Pham and colleagues favoured implicit (indirect) memory tests, as more effective than explicit (direct) ones in the field of marketing, for assessing the unconscious learning and recall during commercials: '*Indirect* memory tests may be more adequate because they assess whether a learning episode (e.g. exposure to brand fragments) facilitates the performance task (e.g. answering questions about brand associations) *without* necessitating recollection of the learning episode.' (Pham & Vanhuele 1997, p. 408)

It appears then that we cannot underestimate the likely effects of a musical soundtrack in an advertisement on subsequent behaviour. A study by Kellaris et al. (1993) examined the effect of background music on advert processing and also found that image-music congruency reinforced consumer's memory and attention. This finding was elaborated upon by Stewart (1998) who tested the extent to which different types of retrieval cues elicited different types of responses and showed that the image interaction with music is more effective in retrieval than image interaction with verbal information. The successful relationship between music and image is acknowledged by film studies. Kalinak comments on the effectiveness of music in films: 'musical accompaniment was thus positioned to affect perception, especially the semiconscious, without disrupting narrative credibility.' (Kalinak 1992, p. 86). Boltz (1991) also mentioned: 'Music can accentuate various qualities of visual activities and thereby enhance their perceptual salience.' (Boltz et al. 1991, p. 594) This is reinforced by Cohen (2001) who asserts that the simultaneous presentation of music and film automatically elicits bottom-up principles that entail perceptual grouping in both auditory and visual domains.

A further important observation regarding the role of music in adver-

tisements relates to level of attention. Krugman et al (1995) report that attention during television viewing is very sensitive, with both programme and commercial viewing often taking place among myriad other activities. Therefore the viewers' visual attention might move away from watching the television screen. In this case auditory stimuli function as informative cues to either guide visual attention back to the television screen (Anderson 1983), possibly via an orienting response, or may serve to transmit aurally the 'visual' message of the actual commercial (Krugman et al. 1995, Morgan & Stoltman 2002).

Although music seems to play an important role in facilitating implicit learning and recall within advertisements, little research has been done to consider music as a 'collaborative sign'. Studies on implicit memory and music focus mainly on unconscious recall of musical features (Halpern 2000, Tillmann et al. 2000, Tillmann & McAdams 2004, Williamon & Egner 2004), and not on visual and verbal information carried by the 'musical vehicle'. The latter, although recognized in anthropological and ethnomusicological studies in children's song (Blacking 1995, Minks 2002), has only been mentioned as a cultural phenomenon of an orally transmitted tradition, and has not been investigated further as a feature of music with psychological and physiological effects.

Few studies have investigated the role of music as a means of implicitly storing and recalling information within the commercial context. Yalch's (1991) empirical study on music as a mnemonic device in communicating advertising slogans, using both direct and indirect tests – albeit in a laboratory environment – concluded that music enhanced memory for advertising slogans when the slogans were incorporated into an advertisement in the form of a jingle or song; 'slogan information presented with music appears easier to retrieve than similar information presented without music (Yalch 1991, p. 273).

In this paper the role of music in implicit learning and recall is evaluated within advertising and during low-attention conditions. We hypothesize that music will have a significant effect in reinforcing implicit learning, and the recall of visual and verbal information in a TV commercial. We also suggest that there will be no difference in the memory performance between musician and non-musician viewers of the TV commercial since music acts as unconscious reinforcement of the learning and recall of information.

## Method

### Participants

Ninety-five participants (39 males, 56 females), aged 18–30 (mean age: 22.2), were recruited from a variety of undergraduate courses at Goldsmiths, University of London, and at the University of Westminster to participate in this task. In return they were offered free snacks and non-alcoholic drinks, and were able to access these during the entire time they were engaged in the project. 45 of them were undergraduate students of the Music Department at Goldsmiths, all of whom were classically trained musicians; 50 were non-musicians, undergraduate students of the School of Computer Sciences and the School of Media, Art and Design, at the University of Westminster.

### Target material

The target material was an advert presented within a 3-minute commercial break during a 20-minute episode of the popular US TV sit-com *Friends*. The break included four adverts, two well known to British audience, and two unfamiliar to the British audience. The two well-known adverts were for Levi's Jeans and Kellogg's Crunchy Nut Cornflakes. The unfamiliar adverts were for Discovery Home and Leisure Channel (broadcast only on Digital TV), and for Nescafé coffee, (a version broadcast globally, especially in Greece and Italy in the years 1998–1999 and, for a very short period of time, in Northern Ireland in 1999).<sup>3</sup> Of these adverts, three were distractor items (Levi's, Kellogg's, and Discovery Channel), while the Nescafé advert was the target stimulus. The target advert was broadcast second while the other unfamiliar advert was the last to be broadcast. All the adverts had similar length, lasting from 30 secs to 45 secs each.

The target advertising spot used in the current experiment was part of the 'Open-Up' Nescafé global campaign in 1998, with commercials broadcast over several months all over the world.<sup>4</sup> This version and the specific product were considered suitable for two reasons: firstly for the absence of cultural, age, gender, and race boundaries associated with a widely used product, and secondly for the fact that it had been broadcast in UK only for a short time and only in Northern Ireland, making it unlikely to be familiar to the participants and therefore not prone to previous explicit or implicit associations. The inclusion of a second unfamiliar advert was to avoid the factor of 'surprise', so that the participants' attention would not be attracted to the target stimulus. It was felt that a

<sup>3</sup> Source: [http://www.nescafe.com/main\\_nest.asp](http://www.nescafe.com/main_nest.asp)

<sup>4</sup> Source: Xtreme Information Advertising Archive, London, UK.

proportion of two familiar and two unfamiliar adverts seemed most natural.

The target stimulus – the Nescafé advert – was produced in four different audio versions:

**1. Jingle:** this was the original English language version. The music was composed by Ilja Gort and the lyrics written by Publicis. The jingle version in English was broadcast globally – no change in language or music was made for the country of broadcast. The refrain of the jingle (the words of which were used in the voiceover versions) was the following:

Open your eyes,  
Open your mind  
Open your thoughts  
Don't stay behind...  
Open-up, Open-up... Nescafé

©Publicis, 1998

**2. Instrumental Music:** this version had no verbal stimulus and it was reinforced only by instrumental music. The music was composed by Loukianos Kelaïdonis in 1988 for a Nescafé TV advertisement broadcast in Greece only. It was chosen because it had similar rhythm to the original jingle, so it fitted easily to the tempo of image editing in the advert. It also had been used for the same product and brand; thus, it was a musical piece approved by the 'creatives' of the advert for the same brand, to reinforce the video of the commercial. Therefore this music accomplished both semantic and formal congruency (Iwamiya 2002) with the image.

**3. Music and Voiceover:** this version contained the instrumental music used for the previous version, plus voiceover. The words for the voiceover were chosen from the lyrics of the original jingle, accentuating the slogan ('Open up'). The voiceover was chosen to be female, since the original jingle was sung by a woman as well. In this way we minimized frequency (Hz) differences in the verbal material between the original and the current version, in order to avoid differences in the degree of attention stimulation. The voiceover was formed by the following phrases of the original jingle: 'Open your mind, Open your thoughts, Open up... Nescafé'

**4. Sound Effects and Voiceover:** this version contained no music and functioned as control version. It contained sound effects and the same voiceover as Version 3 so all the versions with verbal information had the same verbal context phonetically and semantically. The audio effects



were environmental sounds or, as Chion describes (1994, p. 75), *ambient sounds* that corresponded to the scenes shown in the advert; for example, for a scene with two people by the beach, the audio was the sound of waves, which matched the scene both semantically and formally (Iwamiya 2002), as if it were the natural sound recorded in filming.

Each version of the target stimulus was presented within the advert break of the same episode of *Friends*, in the same order and with the same distractor adverts.

### Memory test

A pen and paper test presented in a single package followed the viewing and included three sections. Section 1 tested the overall explicit memory for the episode of *Friends* (direct test). This was to examine whether there was any difference in general memory or attention across the different conditions. Section 2 tested implicit memory for the advert (indirect test). Section 3 tested explicit memory for the advert (direct test).

#### Section 1: Overall memory test

This comprised six free-recall questions regarding the plot of the episode broadcast. Questions related to the beginning, middle and end of each part of the episode, before and after the commercial break.

#### Section 2: Indirect tests for the advertised product

This assessed implicit memory performance in relation to verbal and visual material associated with the advert, and comprised four parts. In the first part, participants were given a list of twelve words: three relevant to the visual part of the advert (gold, child, sea), three relevant to the product (cup, drink, spoon), and six neutral both to the group of adverts broadcast and to the show. The participants were asked to choose as quickly as possible any three words from the list. In the second part, participants were asked to select from a list of six images of faces: one from each advert (i.e. total of four); one from the show they had seen; and one neutral, taken from an advert that was not included in the show. In the third part of this section participants were asked to complete a word fragment, (N \_ s \_ \_ e) which formed the name of the brand (Nescafé). The acute accent was deliberately omitted from the last 'e' of the word, so that it did not act as an extra cue. In the final part, participants were asked to complete the phrase ( \_ \_ \_ \_ - up), which formed the slogan of the advert ('Open-up').

### Section 3: Direct test for the advertised product

This was an explicit multiple-choice test, which informed participants that they were being assessed on a drink advert, and asked them to choose the right product in a list of five drinks (tea, coffee, soft drink, hot chocolate, wine). This was followed by explicit recall for brand name and slogan of the advertised product.

All questions were distributed on paper in such a way that participants had to turn the page in order to complete each task for the three different sections.

### Procedure

The participants took part in the experiment during a break or after their class time. They were assessed in four groups (of 20–22 people), with approximately equal number of musicians and non-musicians in each group. They all watched the same material package with a unique advert break for each group; the advert break in each of the four groups included the same adverts in the same order but with a different audio version of the Nescafé advert in each case.

As this was primarily an indirect test, participants were not told the real aim of the experiment so they would not be focused on the commercial break. They were told that they would watch an episode of *Friends* as broadcast on the television, and that afterwards they would be asked some questions on what they had seen. Usually, before and after a commercial break, there is a scene of 3–4 seconds with the channel logo and the sponsor; the participants were told that the logos of the channel and every scene associated with or including them were removed for copyright reasons.

The TV sets (of 24 and 26 inch screen size) were set at one side of the teaching room, and the participants sat wherever was most comfortable for them (some at seats, others on the floor), and the volume was adjusted according to their preference as well, replicating typical conditions for groups of students watching TV as closely as possible. During the show, participants were allowed to eat and drink (keeping the noise levels low, out of consideration for one another), and they were left with a neutral invigilator (the tutor of the class directly after which the experiment took place), or in some cases left alone, so they would feel free to pay less attention, chat to each other, or help themselves to more drinks and food. It was deemed that this would provide the closest parallel to the normal conditions under which someone would watch TV – or more

specifically, adverts – at home.

There was an interval of approximately fifteen minutes between the end of the show and the beginning of the pen and paper test. During this time participants were chatting to each other, some of them commenting on the show they had seen, and were helping themselves to more food or drinks; they were also allowed to leave the class for a while, if they desired. After the interval, the experimenter entered the class, and distributed to the participants the pen and paper test. They were instructed not to read through it, and not to turn over the pages during the test, unless they were instructed to do so. They were also instructed not to turn back to a question and reconsider or correct their answers. The participants were given limited time to respond, so that spontaneous answers would be achieved, in order for the indirect test to be performed successfully. They were not informed about the time limit in advance, but the experimenter indicated when they were to start and finish each section. They were asked to fill in their biographical information on the front page, and wait until they were told when to start.

The experimenter explained the first section, which required participants to answer simple questions assessing their overall memory for the episode. They were given 90 seconds to finish this section, requesting that those who finished in less time did not turn the page until told to do so.

After everybody had finished Section 1 of the test, related to their overall memory of the whole episode of *Friends*, the experimenter asked the participants to turn the page, explained the next section, and then asked the participants to read the list of the words in 20 seconds. Participants were asked to listen to a 5-second fragment of the target stimulus music or effects – different for each group depending on the version of the Nescafé advert they had seen earlier, and without any voiceover or words in all cases – and tick the three words from the list that seemed to them more naturally associated with this music. They were asked to give their spontaneous reaction and had approximately 15 seconds to complete this task. At the end of this task, they were asked if they had recognized the five-second audio cue they had heard. They were then instructed to turn the page over.

For the next question, participants were asked to look at the images displayed on their page. The participants listened to the same 5-second excerpt of the audio version of the target stimulus they had seen and then chose one of the images, as spontaneously as possible. There were given no more than 10 seconds to accomplish the task. At the end of the task, they were asked again if they had recognized the 5-second audio version they had heard, and they had to tick their preferred answer.

After finishing the above question they were again asked to turn the page over, and were given 30 seconds for each of the two following tasks: completing the word and the phrase. Finally, participants were instructed to turn the page over and complete section 3, which assessed explicit memory of the advertisements. They were given no time limit, but once completed, participants were asked not to reconsider or correct any of the answers they had given, and were asked to hand in the test to the experimenter.

After completion of the experiment, the experimenter explained her work and the real aims of the project in which the participants had collaborated.

## Results

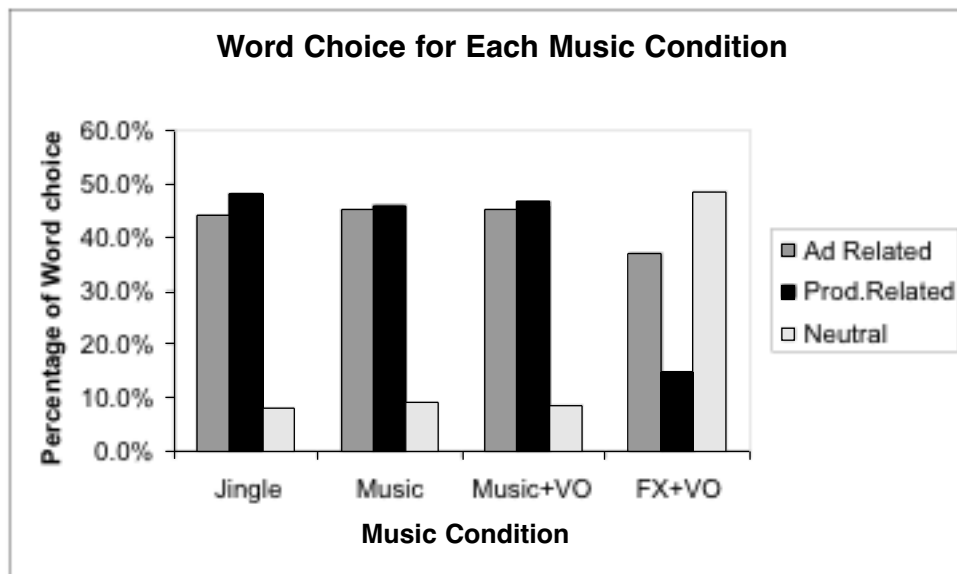
Results for the different memory tests were first compared across the four main music conditions: 'Jingle', 'Music', 'Music with Voiceover', and 'Effects with Voiceover'. Following this, there was further analysis to establish whether findings were consistent across musicians and non-musicians.

### Overall memory for episode

The overall attention of the subjects before and after the commercial break was quite high, since there was a high score for all groups. A one-way ANOVA confirmed that all groups performed similarly, [ $F(3, 94) = 1.024, p > 0.05$ ], suggesting that attention and explicit memory was matched across groups.

### Indirect tests for advertised product

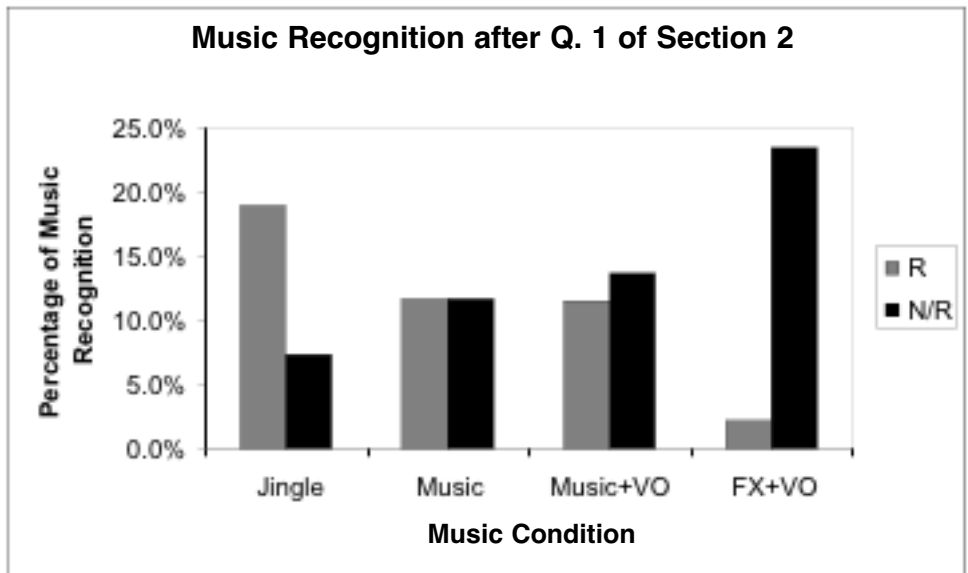
Figure 1 displays the percentage of total word choices for each condition and shows that the experimental groups appear equally likely to select advert/product-related words while the control group appears more likely to select neutral words. A Chi-square test confirms that there is a significant difference in the pattern of responding [ $\chi^2 = 68.747; p < 0.05$ ], thus suggesting that music does have an effect in reinforcing implicit learning and recall of verbal information during exposure to an unfamiliar advert in low attention conditions.



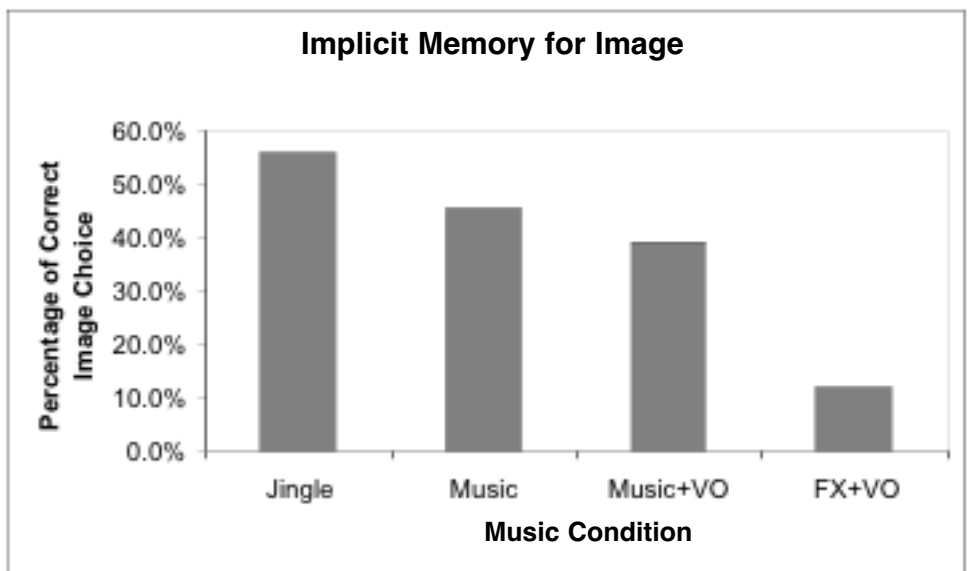
**Figure 1.** Percentages of word choice (Advert-related, Product-related and Neutral) for each condition: Jingle; Music; Music+VO (= Music with Voiceover); FX+VO (= Effects with Voiceover, the Control Group).

Figure 2 shows overall recognition of the auditory cue for all participants, in addition to a breakdown of total responses across all conditions. The highest recognition (18.9% of all participants) was observed in participants who listened to the 'Jingle' condition, while the lowest was observed in the control group (2.1% of all participants). A Chi-square test showed that the pattern of responding was significantly different across groups [ $\chi^2 = 11.761$ ;  $p < 0.05$ ].

Implicit memory for visual material was assessed by examining participants' choice of image and this is summarised in Figure 3. A one-way ANOVA showed that there was significant main effect of condition on image choice [ $F(3, 94) = 4.035$ ,  $p < 0.05$ ]. Post hoc examination of the data, using an LSD test, showed that the participants in the FX+VO condition were significantly less likely to select the correct image than participants in all other conditions ( $p < 0.05$ ), suggesting that there is an effect of music in creating successfully strong associations with the visual part of the advertisement, and thus supporting the hypothesis. Reassessment of recognition of the auditory cue revealed an overall increase but no change to the overall pattern with a Chi-square test once again showing that the pattern of responding was significantly different across groups [ $\chi^2 = 12.203$ ;  $p < 0.05$ ].



**Figure 2.** Percentages of music recognition between the four music conditions after Question 1 of Section 2. R = Recognized, N/R = Not recognized.



**Figure 3.** Percentages of the correct choice of image (Q.2 of Section 2). In contrast to these findings, implicit memory for brand name and slogan did not appear to be influenced by the different music conditions, with a similar overall pattern of response for brand name [ $\chi^2 = 2.299$ ;  $p > 0.05$ ] and slogan [ $\chi^2 = 2.115$ ;  $p > 0.05$ ].

### Direct test for advertised product

When asked to identify explicitly the advertised product from the target commercial, all four groups had similarly high scores, indicating that music has little or no effect on explicit recollection of the product. This was confirmed using a one-way ANOVA [ $F(3, 94) = 1.185, p > 0.05$ ]. A similar trend was found for brand name [ $F(3, 94) = 0.686, p > 0.05$ ] and slogan [ $F(3, 94) = 1.017, p > 0.05$ ], though the latter showed overall lower percentages of correct responses.

### The effect of previous music training on memory

The second part of the hypothesis suggested there would be no significant difference in implicit memory performance between musicians and non-musicians. In order to show whether the latter performance varies with the level of musical skill in the listener/viewer, we considered only overall general memory and those cases where our previous analysis had revealed an effect of music condition.

A two-way ANOVA indicated that there was a main effect of musical training on overall memory, such that non-musicians performed better than musicians [ $F(1, 94) = 5.677, p < 0.05$ ]. For all implicit memory tests there were no significant effects of musical training and no interactions between musical training and condition, thus confirming that the effects presented earlier are not dependent on musical training.

### Discussion

This study offers support for the hypothesis that music facilitates the implicit learning and recall of key features of the advertised product and suggests that music is effective in creating strong associations with the features of the adverts. The finding that soundtrack condition has little impact on the direct tests (overall memory and explicit memory tests) but a clear impact on performance on indirect tests (implicit memory of words and images of the commercial) indicate that music could be considered as catalysing innate grouping of information (in time) and assisting perceptual learning.

In the overall memory test, we observed that the overall attention and conscious recollection of material from the *Friends* episode was similarly high in all groups. Since the questions were carefully chosen to test the overall memory across the whole episode, the results indicate that the show occupied the participants' attention throughout the broadcast. The

above is used as a reference point to appreciate the significant effect of music when implicit memory is tested.

We demonstrate here that, under naturalistic viewing conditions, music appears to increase participants' implicit memory for words and images associated with the advertised product. This is illustrated by the finding that memory for features (images, words) of the commercial was different for groups that have watched a music version of the advert compared with the control group who just heard sound effects and voice-over. When participants were asked to choose words that they considered associated with the target stimulus, those who watched the commercial with some kind of music reinforcement showed a significantly better implicit memory performance than the control group.

There appears to be a polarization in the performance of the participants of the 'Jingle' condition and the control group, a fact that emphasizes the power of rhymes and *metrical mnemonics*; the latter help us connect items that otherwise seem wholly unrelated into a rhythmic pattern, while the former provide an order and a prosodic structure which is associated to melody (Norman 1969). The above is also supported by marketing studies such as Roehm's, whose study showed that memory is enhanced to a greater degree when music invites active generation of lyrics by way of singing along than when music encourages passive listening (Roehm 2001, p. 56). The above identifies with the studies of Scott (1990) and Yalch (1990) who showed that the jingle is the most effective form (in memory terms) of musical reinforcement in TV adverts. Psychology studies also provide evidence that music facilitates recall involving music acting as framework for both encoding and retrieving a text (Wallace 1994). More specifically, Wallace's 1994 study found that:

At encoding, the melody connects and chunks lines and phrases, which assists in learning. At retrieval, the melody provides a framework that indicates how much information must be recalled, where information has been omitted, as well as the order of segments. In a memory representation that stores both textual components and melodic components, the links between the two are valuable retrieval device.'

(1994, p. 1482)

All the above studies are further confirmed in the current experiment, where we can clearly see that 'Jingle' condition was the most effective in implicit learning and recall of verbal and visual elements of the target advertisement.

Importantly, this study shows that the jingle seems to be the most



effective form of music reinforcement in advertising, presumably because it carries verbal information in the form of music and not in the form of speech. In this way, we may speculate that the information is initially perceived and stored, not where verbal information would normally be primarily processed, but as a part of the melody – phonetically, as was suggested in the study of Yalch (1991).

Given that information presented in the form of music clearly influences perceptual learning and implicit memory performance, it appears that music may be effective in attracting information at the level of perceptual categorization, without necessarily bringing it to the level of conceptual categorization (conscious elaboration), before being stored in our long-term memory. Some have argued that this kind of memory performance is dependent on the overlap between perceptual processing at encoding and retrieval (Snyder 2000).

The effect of music is particularly demonstrated by comparing the ‘Music with Voiceover’ and the ‘Effects with Voiceover’ conditions, since they both included the same visual and verbal (spoken) elements and their main difference was the musical reinforcement: music in the case of the ‘Music with Voiceover’ condition, sound effects in the case of the control group. The significant differences in response pattern across music conditions emphasized the effectiveness of music.

It is interesting also to note the fact that the 37% of the words chosen by the control group were advert-related words, which is high but not close to the percentage of the same group of words that the participants from the three music conditions chose. This was more than double the number of product-related words chosen, thus indicating that, in the absence of music, the image is still effective in attracting attention unconsciously – perhaps in the form of mental imagery, since the advert-related words were indirectly linked to images broadcast during the commercial. On the other hand, memory for verbal information was quite poor without the presence of music, as indicated by the low percentage of product-related words chosen by the control group. In general, the choice of both advert- and product-related words was significantly lower in the control group compared to the three music condition groups.

The selection of image associated with the advert displayed analogous results to the word selection task, with the best implicit memory performance displayed in the ‘Jingle’ condition, and significantly poorer implicit memory performance in the control group. The results indicate that music is effective in creating memorable associations with image. In this case, we did not suggest mental imagery or words associated with the image, but provided a still image directly linked to the commercial; this difference may engender the reason why the control group performed

poorly in this question, despite having chosen a high percentage of advert/image-related words in the previous question.

It is also interesting to examine the difference in memory performance for this question and the previous one, between the participants in 'Music' and 'Music with Voiceover' groups. In the word choice, the 'Music with Voiceover' performed slightly better in choosing product-related words, as was noted above. In contrast, in this task, the participants of the 'Music' condition displayed a slightly better performance than those of 'Music with Voiceover'. The above phenomenon could indicate that music/image association functions better than music, image and verbal (spoken) stimuli, as occurred in the case of 'Music with Voiceover', suggesting that it is easier to associate two rather than three elements together. Probably because colour and vision attract attention faster (Wichmann & Sarpe 2002, Rolls 2003, Yucel et al. 2005) – since light travels faster than sound – the first association that takes place is that of image with music; the voiceover as verbal stimulus comes as an extra element, occupying more of our memory storage. The above does not occur in the case of the 'Jingle' condition, since in jingles the verbal element is dealt as part of the melody – as music, and not as an individual verbal stimulus – at least, during perception and storing procedures.

The finding that, after image selection, participants' music recognition was higher throughout all the conditions might indicate that music is best associated with image rather than with verbal stimuli (spoken). On the other hand, participants might have felt familiar with the music the second time they heard it, just because they heard it first some minutes earlier, and thus their increased familiarity may have been due more to frequency with which they heard it than the cues of the test itself. The significant difference in the pattern of responding between the control group and the three music condition groups indicates that musical stimuli are more effective in creating favourable associations with advertising elements than any other audio/sound stimuli.

When the information is forced back to consciousness (explicit recollection), both of the groups that had watched a version of the commercial with a musical reinforcement and the control group performed equally well. This could lead us to conclude that the information was successfully received in both groups (the 'commercial with music' viewers and control group), but that music facilitated *implicit* retrieval. The latter conclusion could be considered misleading, since we are talking about a familiar product (coffee) of a well-known brand (Nescafé); but there are two counter-arguments against the above.

Firstly, the questions of the direct tests required the subjects to recollect the advertised product and brand, and the slogan of the

commercial, while the indirect tests required the retrieval of features of the commercial (words, images) and not the product or brand directly, proving the success of music in this case. Secondly, both the brand and the product were familiar to the participants of the music conditions and to those of the control group as well. Therefore, the divergence in memory performance suggested that music indeed did make the difference in facilitating implicit learning and recall. The poor performance of the control group in the indirect tests suggested that, even for a familiar product and brand, a new commercial creates new implicit associations that are better recalled with a musical reinforcement. Besides this, it is suggested in marketing studies (Pham & Vanhuele 1997) that the aim of the advertiser is to have certain familiar elements in the commercial, in order to revive already established associations; hence, in this case, it is the new associations of the advert with the specific product and brand that are better learned and recalled implicitly with the aid of music.

Regarding the effect of previous music training on memory, there was no significant difference in the memory performance of either musicians or non-musicians, supporting the second part of the hypothesis. The results indicate that when there is no conscious elaboration but just implicit perception, learning and recall, non-musically trained subjects would perform equally well.

Physiological research also shows that listeners can incorporate prosodic features in memory for music in the absence of extensive musical experience (Palmer et al. 2001, p. 542); therefore there is no significant difference in memory performance between musicians and non-musicians, confirming the above conclusions.

In general, the memory performance of both musicians and non-musicians was similar for verbal and visual stimuli of the commercial in association with music. Memory performance was mostly influenced by the musical reinforcement of the advert, and not by the particular musical expertise of the participants, supporting the initial hypothesis. The above phenomenon was further confirmed by the excellent explicit memory performance of all participants for the product, the brand and the slogan of the commercial.

The overall conclusion of the experiment is that music is essential in reinforcing the perception of the information of the commercial, without the viewer's conscious effort; there is also no requirement for particular musical skills for the viewer/ consumer in order for the success of the music function to be guaranteed. The above conclusions support the hypotheses and concur with conclusions from the field of semiotics and physiology on the function of music within TV advertising.

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