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Popcorn in the Cinema: Oral Interference Sabotages Advertising Effects

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Abstract

One important psychological mechanism of advertising is mere exposure inducing positive attitudes towards brands. Recent basic research has shown that the underlying mechanism of mere exposure for words, in turn, is the training of subvocal pronunciation, which can be obstructed by oral motor-interference. Commercials for foreign brands were shown in cinema sessions while participants either ate popcorn, chewed gum (oral interference) or consumed a single sugar cube (control). Brand choice and brand attitudes were assessed one week later. While control participants more likely spent money (Experiment 1, $N = 188$) and exhibited higher preference and physiological responses (Experiment 2, $N = 96$) for advertised than for novel brands, participants who had consumed popcorn or gum during commercials showed no advertising effects. It is concluded that advertising might be futile under ecological situations involving oral interference, such as snacking or talking, which ironically is often the case.

145 words

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Popcorn in the Cinema: Oral Interference Sabotages Advertising Effects

The main purpose of marketing and advertising is to induce a more favorable brand attitude thereby increasing the likelihood of eventual brand choice (e.g., Baker, 1999; Elliott, & Yannopoulou, 2007). A central psychological mechanism of the impact of advertising on brand choice is the *mere exposure effect* (for a review, see Grimes & Kitchen, 2007). This effect, well-established in experimental psychology (Bornstein, 1989), is the phenomenon that any sort of stimulus is preferred when it is repeatedly presented (Zajonc, 1968). This preference in turn is due to higher processing fluency, that is, increased efficiency of information processing, of repeated compared to novel stimuli (Reber, Winkielman, & Schwarz, 1998), with earlier research having shown that high fluency per se feels generally positive (Reber, Schwarz, & Winkielman, 2004; Topolinski & Reber, 2010; Topolinski & Strack, 2009a, 2009c; Topolinski, Likowski, Weyers, & Strack, 2009). In that sense, advertising is simply a method to repeat brands and thus increase the easiness and joy in mentally processing a brand name. Indeed, earlier research has shown that mere exposure of brands actually increases positive attitudes and the likelihood of eventual brand choice (e.g., Baker, 1999; Blüher & Pahl, 2007; Janiszewski, 1993; Matthes, Schemer, & Wirth, 2007; Lodish, Magid, Kalmenson, Livelsberger, & Lubetkin, 1995).

Recent basic research has shown that the causal mechanism of the mere exposure effect, in turn, is the fluency of covert stimulus-specific motor-simulations (Topolinski & Strack, 2009b). The underlying rational for this was the following. For words, for instance, each time a word is encountered, a covert simulation of pronouncing the word takes place (cf., Stroop, 1935). When the word is encountered repeatedly, this covert pronouncing simulation is also repeated and thus runs more fluently for repeated compared to novel words. This gain in oral motor-fluency triggers a positive feeling that drives mere exposure effects (see also Leder, Bär, & Topolinski, 2013; Moreland & Topolinski, 2011; Topolinski, 2010). However, when the oral motor-system is prevented from training such sub-vocalizations, for instance by

merely chewing gum, there is no gain in pronunciation simulation fluency for old over novel words and thus no exposure effects for words (Topolinski & Strack, 2009b, 2010).

Testing this oral embodiment account of the mere exposure effect, Topolinski and Strack (2009b) presented nonsense words and Chinese ideographs (as a control condition) to participants –with a random half of these stimuli repeated– and asked how much the participants liked each of these stimuli. Crucially, two kinds of motor interference were implemented. A control group simply kneaded a ball as a manual interference. This should introduce some distraction but left the mouth free to covertly simulate the pronunciation of the names. A crucial experimental group, however, chewed gum during the presentation of the stimuli, which should prevent their mouth from simulating the words' pronunciation. The result was that the manual group preferred repeated over novel names, but the oral motor-interference group did not. In contrast, both groups preferred repeated over novel ideographs, obviously because neither the manual nor the oral secondary task interfered with the merely visual encoding of these images.

Moreover, Topolinski and Strack (2009b, Experiment 3) investigated a double dissociation between two sorts of stimuli and two sorts of simulation modality. Specifically, in another experiment they presented (partially repeated) words and tunes. While words are to be spoken, tunes are to be sung. Thus, it was hypothesized that a mere exposure of a tune leads to a singing or humming simulation in the vocal folds. Testing this, humming as a vocal interference was implemented that should prevent the vocal folds from covertly simulating the voice pitch variations of the tunes but leave the mouth free to simulate word pronunciations. In contrast, a tongue movement exercise was implemented as a purely oral interference that should (such as chewing gum) prevent the mouth from simulating word pronunciations but leave the vocal folds free to simulate the tunes. And that was actually what was found: participants in the vocal interference condition showed a mere exposure effect for words, but

not for tunes, while participants in the oral interference condition showed a mere exposure effect for tunes, but not for words.

In sum, these recent findings support the notion that mere exposure effects hinge on the fluency of stimulus-related motor-simulations. Furthermore, since repetition is only one of many ways to increase processing fluency (Reber, Schwarz, & Winkielman, 2004), the same should be expected for other fluency manipulations. For instance, Song & Schwarz (2009) presented relatively easy (e.g., Magnalroxate) or hard (e.g., Hnegripitrom) to pronounce names of ostensible food additives. In this case, the fluency does not stem from repetition but directly from pronunciation itself. They found that participants rated the easy-to-pronounce additives as being less harmfull than hard-to-pronounce ones. Obviously, participants had based their judgments on the easiness of pronouncing a given name. Testing whether also this fluency is orally embodied, Topolinski and Strack (2010, Experiment 3) replicated the experiment under manual and oral interference and found the pronunciation-easiness effect for manual interference only.

Although the multidimensionality of sources determining brand attitudes has long been researched (e.g., Keller, 2003) and there have been various recent advances into the underlying cognitive and affective mechanisms in brand attitude formation (e.g., Esch, Möll, Schmitt, Elger, Neuhaus, & Weber, 2012; Reimann, Castaño, Zaichkowsky & Bechara, 2012; Schmitt, 2012; Venkatraman, Clithero, Fitzsimons, & Huettel, 2012) this embodied source of oral motor-fluency has not been considered to date.

Ironically, many everday life situations involving advertising also involve continuous oral interference, such as nibbling snacks while watching TV, or eating popcorn in the cinema while watching the commercials before the main movie. Thus, it is likely that these settings also sabotage oral fluency gains from mere exposure. Because fluency effects play an important role in consumer choices (Alter & Oppenheimer, 2006; Novemsky, Dhar, Schwarz, & Simonson, 2007) we hypothesized that oral interference should also hamper the impact of

exposure on brand attitudes and choice. The present experiments were designed to test this idea in controlled field studies.

Experiment 1

A cinema session involving eating candy during the presentation of commercials for competitive sets of unknown brands (body lotions, charity foundations) was held in a lecturing hall. The likelihood of spending money on the advertised brands (purchasing body lotions, donating for charity foundations) in an interbrand choice one week later was the dependent measure. Data collection was divided into two campaigns, each with different samples, one featuring popcorn and one featuring gum as oral interference. Each of these campaigns realized as between-subjects design an oral interference (popcorn or gum) condition and a control condition (always a sugar cube) and consisted of a study phase (the actual cinema session) and a test phase one week later. Gum was chosen as an additional instantiation of oral interference to rule out distraction: consuming popcorn does not only entail oral movements, but also taking the popcorn out of the bag and looking into the bag. Thus, if chewing gum would also block advertising effects, then the impact of eating popcorn could not be attributed to distraction. We predicted that participants in the control group would more likely choose advertised than novel options, while participants with oral motor-interference would not show such an advertising effect.

Method

Participants. N = 197 female psychology freshmen from a university in their first week of courses participated for course credit (mean age 21, SD = 3). Nine of them did not attend the test phase (see below), resulting in N = 188. Since the base rate of women is generally much higher in psychology courses, only female students were invited. Experiment 2 also involved male participants.

Materials. We used 6 real commercials downloaded from the internet for existing body lotion brands, namely *Arko Nem*©, *Aveeno*©, *Emeron*©, *Puhas Loodus*©, *Boroplus*©, *Innisfree*©. The language was always non-German. Pilot studies had shown that these products were unfamiliar to German participants. Product names were verbally mentioned within all the commercials. The commercials ranged in length between 15 – 61 seconds (M = 31, SD = 16). Furthermore, we used 6 fictitious names of charity foundations (*Sitais Geteref*, *Désecona Seltes*, *Aevenge Etarnes*, *Aexilieste Jomé*, *Cirates Cencare*, *Flendur Kagintes*) that were featured in advertising slides with some ornaments and one catch-phrase (e.g., *For a life against cancer*) of 7 seconds presentation length. Filler commercials were for mineral water brands, lemonades, and potato chips. The short films in test phase were in the popcorn campaign, *Verschollen über den Wolken* (21 minutes in length), and *Zero* (12 minutes in length), in the gum campaign.

Procedure. In the *study phase*, groups of 20-25 individuals were brought into a dimly lit lecturing hall. The audience was divided into a right and a left half (with a viewing screen, approx. 3 X 5 meters, for each) using viewing partitions that also prevented each group from seeing what the other group received. Participants were randomly assigned to the halves. One half received 65 gram popcorn or a chewing gum (oral interference conditions) and the other half received a sugar cube (control, comparable in hedonic experience and some caloric input). The assignment of conditions to right and left halves was counter-balanced across sessions; snacks were delivered in hygienic paper bags to the seats. Due to the viewing partitions between the halfes and the dim light, participants could not see what the other half was consuming.

Participants were informed that a typical cinema session would be simulated and that they would later answer some questions concerning the movie. Participants were instructed to start consuming their respective snack while three filler commercials (115 seconds in length) were presented. Compliance with these instructions was observed and enforced by research

assistants. The time of the filler commercials served as a buffer for the control participants to consume the sole sugar cube. Then the crucial target commercials were shown in a fixed random order (one random half of the body lotions and of the charity foundations, respectively; materials counter-balanced across participants) intermixed with further filler commercials. By the time the target commercials were presented, the control participants had already consumed their sole sugar cube (as tested in pilots and carefully observed by research assistants during the session) so that no further oral interference took place for them. The popcorn group, conversely, took the whole duration of the commercial presentation or more to consume their popcorn. After the commercials (total length 8 minutes) a short film was shown and then participants answered some filler items about the movie as well as on mood and eating behavior on a paper-pencil questionnaire.

The *test phase* was implemented one week after the study session. Participants attended the test phase in the same groups as in the earlier cinema study sessions. They were brought into a café and were given a small paper purse containing 4 €1-coins. They were told that this was an additional reward for the participation, which they had to spend during this session. To justify the cover story of product testing and to induce a relaxed consuming mind-set, they were asked to spend 2 of the 1€ coins for snacks and beverages on the menu (each product € 1) and freely chat with each other. The menu cards featured some of the advertised beverages and chips from the filler commercials of the study session to familiarize participants with the idea that some products from the study session would re-occur and to reduce their suspiciousness on the later re-occurring lotion and charity foundation names. After they consumed their orders, participants were brought to two stands involving the interbrand choices one at a time. The other participants could not see these choices.

Body lotion purchasing. On a stand, 6 plastic bottles filled with 50 ml body lotion and prepared with stickers depicting the 6 product names (alphabetical order from left to right), with slightly varying ornaments and colorings were presented together with a money

box for each product. Crucially, half of the names have been advertised in the cinema session (stimulus assignment counter-balanced across participants). Participants were asked to choose one bottle and to put €1 into the respective money box, observed by a research assistant.

Donation. On a second stand, 6 donation cans featuring the 6 names of the charity foundations (alphabetical sequence from left to right) were presented and participants were asked to read all names and then to drop €1 into one of the boxes. Again, half of these names had been advertised.

Data assessment. Unbeknownst to the participants, depending on their oral-interference condition they had received either 1€-coins with a German image on the national backside of the coin, or a non-German image from another issuing country (assignment of nationality to interference condition counter-balanced across groups). Due to the high degree of intermingling of coins from different issuing countries in Europe, this manipulation was unobtrusive. After the experiment, the number of German and non-German coins in the respective money boxes were counted. Since assignment of product names to old vs. new status was the same for one experimental group, and groups of individuals were the same as in the study sessions, the number of coins assigned to old vs. new products could easily be assessed by simply counting German and non-German coins in the money boxes.

Results

Because the present data are categorical and coins could not be assigned to individuals, we ran both parametric and non-parametric analyses, which yielded similar results. Because they are more common to readers, we first report the more illustrative parametric analyses.

Parametric analyses. A 2 (oral interference: yes, no; between) X 2 (type of oral interference: popcorn, gum; between) X 2 (product: buying a lotion, donating for an organization; within) mixed ANOVA on the likelihood of choosing an advertised option

found a significant main effect of oral interference, $F(1, 184) = 26.85$, $p < .0001$, $\eta_p^2 = .13$. Thus, we collapsed over product and type of oral interference (gum or popcorn). The group with no oral interference showed an advertising effect. They chose the advertised products with a likelihood of 59 % (*SD* = 0.34, *SE* = 0.04), which is reliably above the chance level of 50 %, $t(91) = 2.42$, $p = .017$, $d = 0.26$. However, the groups with oral interference showed no advertising effect. They chose the advertised products with a likelihood of 37 % (*SD* = 0.22, *SE* = 0.04), which was even below chance level, $t(96) = 5.78$, $p < .001$, $d = 0.59$.

As a side result, there was also an interaction between oral interference and type of oral interference, $F(1, 184) = 3.99$, $p = .047$, $\eta_p^2 = .02$. However, as Figure 1 shows, this interaction was driven by the conceptually irrelevant fact that the likelihood of chosing an old lotion was lower in the control group for the popcorn subsample than in the control group for the gum sub-sample.

Non-parametric analyses. Non-parametric analyses using Chi-square yielded the same pattern. Participants with no oral interference chose the advertised product more often than participants in the oral interference group, $\chi^2(1, N = 188) = 7.65$, $p = .0006$. The likehood of chosing an advertised option was higher than chance level in the group with no oral interference, $\chi^2(1, N = 92) = 4.38$, $p = .037$, but lower than chance level in the group with oral interference, $\chi^2(1, N = 96) = 4.17$, $p = .041$.

Discussion

As predicted, while participants in a control condition showed advertising effects, oral interference due to eating popcorn or chewing gum while watching commercials reduced this advertising effects for an interbrand choice of initially unfamiliar brands as measured one week later. This blockade was effective both for purchasing a product and donating money. Although not predicted, we even found a reduction of consumer choice likelihood due to oral interference. Such a reversal of preference due to repetition has not yet been observed in

previous studies on oral interference (Topolinski, 2012; Topolinski & Strack, 2009b, 2010) and was not replicated in Experiment 2. Thus, tentatively we speculate the following possible mechanism for this. It is possible that experiencing oral motor interference during encoding the brand names in the commercials caused a negative affect because the usually running pronunciation simulations were disturbed, such as any dual task that draws on the same resources is troubling (Pashler, 1994). Later in the test phase, encountering the advertised brand names re-activated this feeling of disturbance, while novel names did not, which caused the present pattern. However, a reversal of advertising effects due to oral interference was not theoretically predicted and should be interpreted cautiously.

The alternative mechanism that consuming a sugar cube was frustrating or irritating compared to particularly the popcorn group is unlikely since –if at all– negative mood would induce a systematic mind-set rendering persuasion effects more unlikely (cf., *cognitive tuning*, Schwarz, 2002), as has been shown for brand names (Maheswaran, Mackie, Chaiken, 1992). However, it was the sugar cube-group that showed advertising effects. Also, participants in the sugar cube condition could not see what the other group received due to the viewing partitions in the hall. Also, a possibly greater hunger in this control group is an unlikely mediator of the present effects, since the target products were not food-related. Finally, the alternative explanation that eating popcorn compared to eating a sugar cube simply distracts attention away from the to-be-encoded commercials is ruled out by the fact that chewing gum, which does not distract vision at all, led to the same inhibition of advertising effects. The second experiment should map the causal attitudinal undercurrents of these monetary brand choices in an even more ecologically valid set-up.

Experiment 2

A cinema session was held in a real movie theatre presenting commercials of various foreign products under oral interference or control conditions. One week later, we assessed

participants' attitudes towards the brands. In general, attitudes can be assessed by direct verbal reports, but also via more indirect measures that assess also unconscious attitudinal determinants of consumer choices that stem from implicit memory (Shapiro & Krishnan, 2001; Strack, Werth, & Deutsch, 2006). For instance, a diffuse familiarity due to implicit memory that is not necessarily conscious can nevertheless guide preferences and can drive advertising effects even after long time lags (Shapiro & Krishnan, 2001). One physiologic measure of implicit memory is electrodermal activity (EDA), that is, the activity of the sweat glands, such as in lie detecting. Recent research has shown that EDA rises for previously presented stimuli, even when the participant is not aware of the previous encounter anymore (de Vries et al., 2010; Morris, Cleary, & Still, 2008; Topolinski, 2012). An important advantage of such indirect, or implicit, measures is that they are unlikely to be biased by conscious or strategic processes of the participant, such as conscious recollection of the prior advertising and resulting reactance against this persuasion attempt (Shapiro & Krishnan, 2001). Moreover, EDA has been shown to be a powerful predictor of sales results (La Barbera & Tucciarone, 1995). Therefore, we assessed both explicit attitudes via verbal-reports and implicit memory via EDA in respective sub-samples of this study. We predicted that participants in the control group would show more positive attitudes towards advertised than novel options, both for explicit and implicit attitude, while participants with oral motor-interference would not show such this advertising effect.

Method

Participants. $N = 98$ (85 female, 13 male; mean age 21, $SD = 3$) psychology freshmen in their first week of courses from a university took part for course credit. Two participants did not attend the test phase, resulting in $N = 96$.

Materials. Real commercials and images of 36 actually existing foreign products and their brand names were used, namely *Boags*, *Carling*, *Dorna*, *Drench*, *Fevicol*, *Finax*, *Fizz*

Diamond, *Fritos*, *Genex*, *Gyumri*, *Innis Free*, *Kinki*, *Kokanee*, *Lacvert*, *Lays*, *Leonidas*, *Lumög*, *Lurpak*, *Maeil*, *Magjia & Shkenca*, *Margo*, *Max Havelaar*, *Montavit*, *Motilium 10*, *Ngan Yin*, *Nurofen*, *Palitte*, *Panapp*, *Pert Plus*, *Puhas Loodus*, *Soyjoy*, *Stella Artois*, *Tostitos*, *Tsubaki*, *Veikkaaja*, *Wacoal*. The products were beverages, foods, medicines, perfume, snacks, toiletries, underwear, and magazines. Pilot studies had shown that these products were unfamiliar to German participants. The language in the commercial was always non-German. The commercials were retrieved from various internet resources and were on average 32 seconds in length (ranging from 15 to 82 seconds, SD = 14). The product name was auditorily mentioned in half of the commercials, counter-balanced across experimental conditions. This pool was selected from a larger pool of stimuli (N_i = 60) according to moderate valence and arousal ratings of the commercials in a pilot study (N = 29). The movie in the cinema session was the animation short film *Big Buck Bunny* (10 minutes).

Procedure. In the *study phase*, participants were tested in two groups of around 50 individuals. The procedure of the study session was similar to Experiment 1 except for the following modifications. The sessions took place in a real movie theatre. Popcorn portions were 70 gram. This time, the oral interference (popcorn) and control (sugar cube) groups were separated from each other by seating the participants either in the front or back rows, respectively (with assignment of condition to front or back counter-balanced across sessions) and leaving the middle rows empty. Due to the dim light in the cinema hall, neither group could see what the other received. After instruction and ascertaining that participants had started consuming the snacks, 6 filler commercials (together 4 minutes in length) were presented to ensure the sugar cubes had dissolved in the control participants' mouths. The longer time of preceding filler commercials (4 minutes) was chosen because participants' oral behavior could not readily be observed in the dark room. Therefore, the longer time ensured that all participants in the control condition had consumed the sugar cube by the time the target commercials were presented, so that they experienced no oral interference while

watching them. As a pilot study (N = 25) had shown, no participant of an independent sample was able to hold a sole sugar cube in the mouth without complete dissolving of the cube for longer than four minutes, even when instructed to keep at least some sugar particles intact as long as they can. Then, the target commercials were shown (one random half of all products, counter-balanced across sessions) in a fixed random order (total length 14 minutes) followed by a short movie. After the movie, participants received a paper-pencil questionnaire with some filler items with ratings for the movie, mood, and their eating behavior.

For the *test phase* one week after the study sessions, participants were randomly assigned to one of the following dependent measures.

Liking ratings. A randomly chosen subsample of n = 56 (28 control, 28 popcorn) was presented the images of all 36 products in random order on a PC screen for 5 seconds each and was asked to indicate their spontaneous preference for the product on a 7-point Likert scale (0 *not at all* to 6 *very much*).

Electrodermal activity (EDA). A randomly chosen subsample of n = 40 (20 control, 20 popcorn) was presented the images of all 36 products for 10 seconds each while electrodermal activity was assessed without any judgmental task. Skin conductance was measured using two Ag/AgCl surface electrodes placed on the hypothenar eminence of the palmar surface of the left hand and recorded with a V-Amp 16 amplifier (Brain- Products Inc., Richardson, Texas) at 1,000 Hz. Data were stored on an additional PC. As an indicator of SCR, the difference between the skin conductance level for the 10 s of product image presentation and a prestimulus baseline of 1 s before stimulus onset was calculated (cf. de Vries et al., 2010; Morris et al., 2008). This SCR was then collapsed over the 18 advertised and 18 novel products. In these averaged SCRs, seven participants exhibited electrodermal activity 2 *SD*s above/below the sample mean. Their data were discarded (cf., Topolinski, 2012).

Results

Preference ratings. In the control group, advertised products were liked more (M = 3.03, SE = 0.14) than novel products (M = 2.78, SE = 0.14), $t(27) = 2.98$, $p = .006$; d = 0.37. In contrast, the popcorn group did not show this effect ($M_{advertised}$ = 2.70, SE = 0.13 vs. M_{novel} = 2.71, SE = 0.17, $t < 1$. However, in a 2 (exposure: advertised, novel products; within) X 2 (oral motor-interference: yes, no; between) ANOVA the interaction term between exposure and oral interference was only marginal, $F(1, 54) = 2.22$, $p = .093$ (other Fs < 2.7, n.s.) probably due to the small sample size (Rosenthal, Rosnow, & Rubin, 2000).

EDA. In the sub-sample (n = 40, 7 exclusions, see methods' section) in which we assessed EDA we found the following pattern. Participants in the control group showed higher SCRs to advertised (M = -0.01, SE = 0.1) than to novel products (M = -0.05, SE = 0.01), $t(16) = 2.28$, $p = .037$, $d = .76$, which is the default response to familiarity (Topolinski, 2012). This effect was absent in the popcorn group ($M_{advertised}$ = -0.04, SE = 0.01 vs. M_{novel} = -0.01, SE = 0.01, $t < 1.54$, $p = .15$). This pattern was supported by a 2 (exposure: advertised, novel products; within) X 2 (oral motor-interference: yes, no; between) ANOVA yielding only an interaction between exposure and oral interference, $F(1, 31) = 7.10$, $p = .012$; η_p^2 = 0.19 (other Fs < 1).

Discussion

Both autonomous responses and brand evaluations were increased for advertised compared to novel products, but only in the control group and not in the group that ate popcorn while watching the advertising commercials.

Meta-analysis of present results

Although the patterns of findings were consistent across Experiment 1 and 2 and their different dependent measures, not all individual findings were significant. Hence, we wanted

to test the validity of the overall pattern using two meta-analyses. Since Experiment 1 featured variables on a categorical, and Experiment 2 variables on an interval scale, we chose the following two approaches.

Stouffer method. Following Rosenthal's (1978) advices we chose the Stouffer method for combining the present results because we had a small *N* of studies and *t*-values were not available for Experiment 1. The Stouffer methods simply requires to divide the sum of the standard normal deviates or *Z*s associated with the one-tailed p-values obtained in each study by the square root of the number of studies being combined. Because EDA and liking were assessed on independent samples in Experiment 2 and were not treated as a between-factor, we treated these two sub-samples as two independent studies. As *p*-values, we chose the *p*-value of the Chi-square test of unequal distribution across oral and control groups in Experiment 1, and the *p*-values of the interactions in Experiment 2 (since these interactions test our crucial prediction). The resulting $z = -4.40$ was highly significant, $p < .00001$.

Non-parametric joint analyses. First, we derived a common measure on rank scale for all studies. For Experiment 1 in which participants had two choices (buying a lotion and donating for charity), we averaged the likelihood for a given participant of choosing an advertised product, this average could be -1 (in both choices the participant had chosen a novel option), 0 (for one of the options the participant had chosen an advertised product), or 1 (in both choices an advertised option was chosen). For Experiment 2, we simply calculated the difference in liking/EDA for old vs. novel products and assigned -1 to participants for whom this difference was below zero, and a 1 when this difference was above zero. Thus, for both experiments the derived measure indicated whether the participant had preferred an advertised or novel product. Both a Mann-Whitney U-Test, $U(277) = 6311.50$, $p < .00001$, and a Kruskal-Wallis H-Test, $H(1) = 27.61$, $p < 0.0001$, found that in control groups the likelihood was higher to prefer an advertised option than in the oral-interference groups.

General Discussion

In the present experiments, we investigated the role of motor fluency in the mere exposure effect for advertising (Grimes & Kitchen, 2007). We hypothesized that the driving mechanism for more positive attitudes for repeated compared to novel brand names is the efficiency of covert sub-vocalizations, or pronunciation simulations, of brand names, which run automatically during encountering a name (Stroop, 1935) and are trained when these names are encountered repeatedly (Topolinski & Strack, 2009b). We prevented the mouth from covertly simulating name pronunciations and thereby train pronunciation for advertised brands by letting participants do what is most often done in media situations involving advertising, consuming snacks.

We found that oral interference indeed obstructed exposure-effects on brand attitudes (Experiment 2) and even brand choice itself (Experiment 1). While control participants showed more positive attitudes for and were more likely to spend money on previously advertised compared to novel products, participants who had eaten popcorn (or chew a gum) did not show advertising effects. Striking, not only explicit brand attitude, but also unconscious physiological responses of skin conductance level (La Barbera & Tucciarone, 1995; Shapiro & Krishnan, 2001) were affected.

This pattern of findings show that motor components play a key role in fluency effects. Converging with other most recent findings, the present studies on advertising brands show that it is the efficiency of bodily resonances that are automatically and unconsciously triggered by the brand names that drives preferences (cf., Leder et al., 2013; Sparenberg, Topolinski, Springer, & Prinz, 2012; Topolinski, Maschmann, Pecher, & Winkielman, 2013). In the following, we address possible alternative explanations and finally implications for applied issues.

Alternative explanations

For the present findings, several possible alternative mechanisms could be thought of, which we will discuss in the following.

Distraction and frustration. As already discussed in Experiment 1 it is possible that eating popcorn during watching commercials is both more pleasant and more distracting than the control condition in which participants received a sole sugar cube that was already dissolved at the time the commercials were presented, which could be the actual cause of missing advertising effects. However, the activity of chewing a tasteless gum had the same impact as eating popcorn in Experiment 1, although being less pleasant and not at all distracting from commercials.

Recognition. It is possible that participants could simply remember the products from the earlier commercials and chose those products that they recognized (see Janiszewski, 1993; Shapiro & Krishnan, 2001). The present oral interference simply disturbed this conscious memory effect. Although such recognition effects were not technically ruled out in the present experiments, they are unlikely alternative mediators because of the following. First, conscious recognition of the products is unlikely because participants had also seen several filler commercials for other products and there was a delay of one week between watching the commercials and the eventual test phase. Furthermore, generally recollection plays no causal role in the link between advertising and consumer choice (Janiszewski, 1993; Lodish et al., 1995). And finally and most importantly, in several experiments dissociating different memory components, Topolinski (2012) has shown that oral interference impairs both implicit memory and preference (as in the current studies), but leaves conscious recognition unaffected.

Brand names or visual appearance of products. Encountering a product does of course not only entail reading the brand name, but also perceiving the visual appearance of the product and its packing, for instance color and shape. Thus, maybe these visual cues are

more important in brand choice than simply the name and were affected by the current manipulations. However, the pattern of the present results strongly suggests that participants based their choices on the brand name (cf., Fombrun & Shanley, 1990; Maheswaran et al., 1992). First, in Experiment 1 participants did not see images of the products in the test phase when chosing lotions and charities, but saw only the brand names. Thus, a visual route was not even possible. Second, there is no plausible way in which the perceptual encoding of the visual appearance could be blocked by oral interference: eyes are not affected by a chewing mouth. Note that Topolinski and Strack (2009b, Experiments 1-2) had found that mere exposure for images (Chinese ideographs) was not blocked by oral interference. Thus, it was the brand name and not the products' visual appearance that drove the current advertising effects and was blocked by eating popcorn.

Implications for Applied Issues: Snacking and Commercials and the Exclusive Importance of Brand Names

The present evidence in ecologically valid set-ups, in combination with earlier basic research on detrimental effects of oral interference on preference and memory for verbal material (Topolinski, 2012; Topolinski & Strack, 2009b, 2010) suggests that advertising for novel brands may be futile for snacking cinema audiences, which contradicts common marketing strategies. Generalizing from the present to other set-ups, it might be speculated that also commercials in TV (Lodish et al., 1995) would fail to induce a positive attitude towards advertised novel brands for snacking or even talking TV audience. This possibility should be addressed in future research.

Given that the current consumer choices so exclusively draw on the brand names themselves as heuristic cues (Maheswaran et al., 1992) and not on the products' visual appearance, and given that the current manipulation targeted particularly on the verbal system, it might be concluded that in order to avoid such detrimental effects, advertising

should focus more on products' visual appearance. This might overrun oral interferences on the brands themselves and might establish implicit memory and thus positive attitudes towards the product on a visual route. However, the present Experiment 2 did use images of the whole products, including their design and layout, and still found detrimental effects of oral interference.Participants in that study could well focus on the visual appearance of the product, its color, shape, and layout, ignoring the brand name. However, obviously they did not. This suggests that even when additional perceptual and contextual cues are available, individuals focus on the brand name, and not on other cues (cf., Fombrun & Shanley, 1990; Maheswaran et al., 1992).

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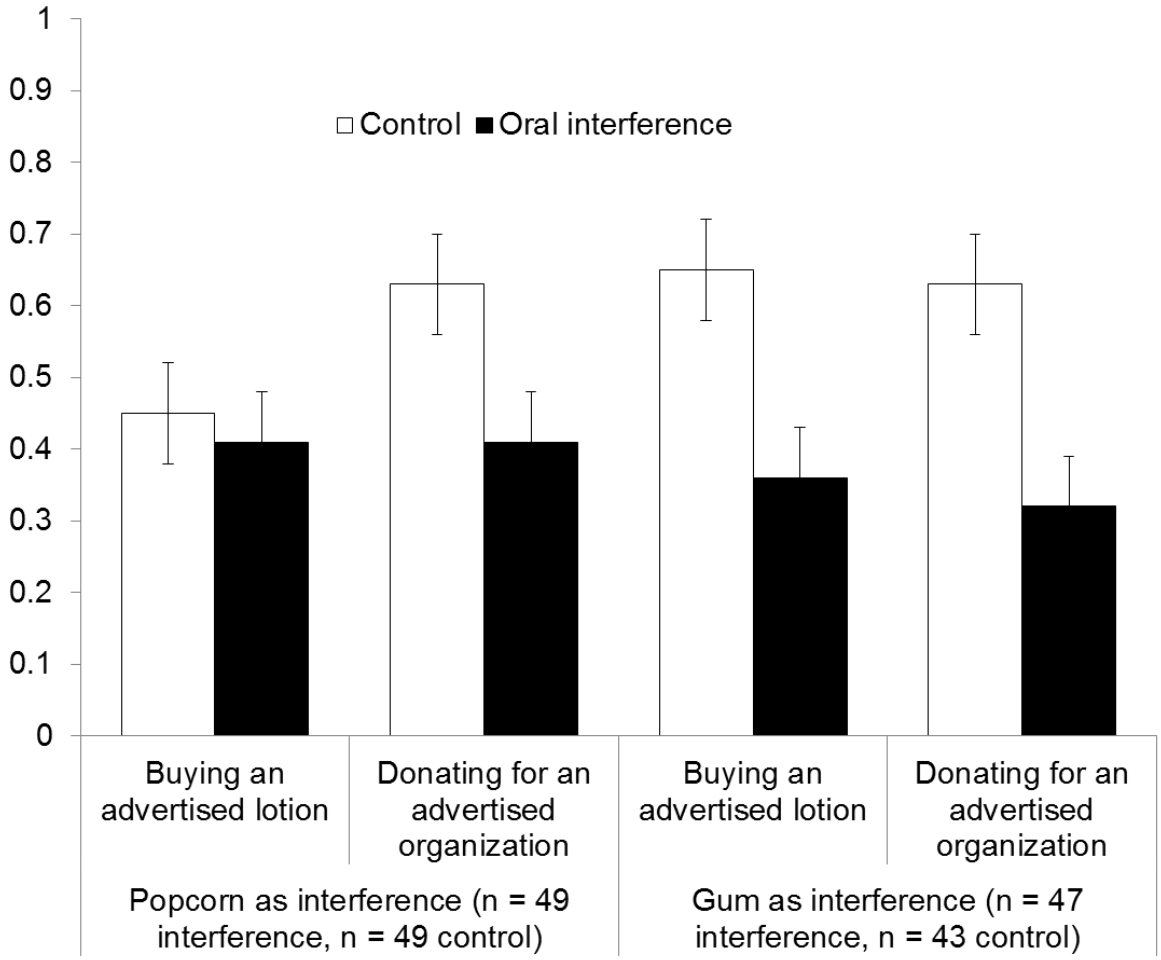

Figure 1: Likelihood of choosing an advertised option in Experiment 1 (error bars are standard errors).