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Matching Communication Modalities: The Effects of Modality Congruence and Processing Style on Brand Evaluation and Brand Choice

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Abstract

Previous research has shown that prior brand exposure (e.g., through advertising) can positively influence brand consideration, brand attitudes, and brand choice. In the present studies, the authors argue that the effects of prior brand exposure depend on the communication modality (visual vs. aural) in which exposure (i.e., advertising) takes place and the modality in which evaluations and choices are made. It was hypothesized and found that congruence in communication modalities has a positive effect on brand evaluation and brand choice, compared to incongruence in modalities. Perceptual fluency is proposed to be the underlying mechanism explaining these effects. Moreover, the results demonstrated that the effects of modality congruence are moderated by individuals' processing style in such a way that the impact is stronger under conditions of data-driven as opposed to conceptually driven, processing. These results indicate that consumer responses depend on the interaction between the modality in which consumers are exposed to the brand in advertising and the modality in which consumers encounter the brand in a purchase situation.

Keywords

modality, processing fluency, brand exposure, brand evaluation

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On average, people are exposed to more than 1,000 commercial messages each day (Kotler & Keller, 2005). Not only are we being exposed to brands in visual advertisements on billboards and Web sites, in magazines and emails but also to brands in aural commercial messages on the radio and through personal selling. Many studies have focused on the content, framing, and design of these messages on consumers' attitudes, preferences, and intentions (e.g., Chang, 2002; McMillan, Hwang, & Lee, 2003; Shen & Dillard, 2007; Yates & Noyes, 2007). The present research extends this work by focusing on the medium through which commercial messages reach the audience. How do differences in communication modality (i.e., visual or aural presentation) affect brand evaluations and brand choices? Do visual and aural brand exposures result in similar effects? Previous research has shown that prior brand exposure (e.g., during advertising) enhances brand consideration and brand choice (e.g., Coates, Butler, & Berry, 2006; Karremans, Stroebe, & Claus, 2006). In the present studies we argue that effects of prior brand exposure on brand evaluation and brand choice depend on the communication modality in which evaluations are formed and choices are made. More specifically, we propose that the effects of prior brand exposure increase when consumers use the same sensory process (seeing or hearing) during exposure to the brand advertisement and during evaluation and choice (i.e., when deciding whether or not to buy a particular brand). It is expected that perceptual fluency is the underlying mechanism explaining the relation between modality congruence and brand evaluation and brand choice in such a way that modality congruence enhances perceptual fluency which in turn positively affects evaluation and choice. Moreover, we argue that the effects of modality congruence on brand evaluation and brand choice will not be equally strong in all situations. We propose that these effects will be stronger when recipients' attention, during exposure, is explicitly drawn to the physical characteristics of the brand name.

Perceptual Fluency and Evaluation

Zajonc (1968) demonstrated that repeated exposure to a neutral stimulus leads to increased liking of the stimulus even when individuals are not aware of having been previously exposed to the stimulus. For instance, he found a positive relation between number of exposures to Chinese ideographs and ratings of positive affect toward these ideographs (Zajonc, 1968; Study 2). Hence he argued that familiarity leads to liking. This effect has proven to be robust for various types of stimuli and various evaluation procedures (see Bornstein, 1989 for a review). One explanation for this mere exposure effect is "perceptual fluency": the experienced ease of processing or recalling information (e.g., Lee, 2001; Reber, Meier, Ruch-Monachon, & Tiberini, 2005; Seamon, Brody, & Kauff, 1983; Whittlesea, 1993; Winkielman, Schwarz, Fazendeiro, & Reber, 2003). High fluency is generally experienced as hedonically positive as reflected in psychophysiological measures (Winkielman & Cacioppo, 2001). Research on perceptual fluency has shown that fluent processing (which can originate from prior exposure) leads to more positive evaluations of the stimulus (e.g., Lee & Labroo, 2004; Reber,

Winkielman, & Schwarz, 1998) because individuals (mis)attribute the positive feelings of perceptual fluency to the stimulus at hand.

These findings suggest that repeated brand exposure (e.g., through advertising) could lead to more favorable brand evaluations as a function of perceptual fluency. Brands encountered previously become (temporarily) more accessible, which enhances perceptual fluency. Studies on the effectiveness of prior brand exposure (i.e., priming) on brand name recall, brand recognition, brand judgment, and brand choice have indeed demonstrated positive effects of repeated brand exposure (e.g., Butler & Berry, 2001; Chung & Szymanski, 1997; Janiszewski, 1993; Janiszewski & Meyvis, 2001; Nebenzahl & Hornik, 1985; Pham, 1992) at least up to a certain number of exposures beyond which positive effects start to diminish (Baker, 1999; Batra & Ray, 1986; Bemmaor & Mouchoux, 1991; Calder & Sternthal, 1980; Pieters, Wedel, & Rosbergen, 1999).

In extension to these findings, we propose that an important qualifier for the process of ad-induced perceptual fluency is modality congruence. Based on the notion that perceptual similarities(differences) between exposure and retrieval enhance(decrease) priming effects on memory tasks (see Roediger & McDermott, 1993 for a review), we expect that a brand is processed more easily—and subsequently evaluated more positively—in a situation of modality congruence than in a situation in which modality differs between exposure and evaluation phase. Hence it is argued in the next section that a visual(aural) brand advertisement is more effective in influencing brand evaluation and brand choice when brands are visually(aurally) perceived during the evaluation or purchase situation (i.e., same-modality) than when the modality differs during exposure and evaluation context (i.e., cross-modality).

Modality Congruence and Evaluation

Research on implicit memory has shown that surface alterations between the exposure and the retrieval phase can diminish priming effects on various implicit memory tasks and consequently on processing fluency (Franks, Bilbrey, Lien, & McNamara, 2000; Roediger & McDermott, 1993). Changes in surface features may involve alterations as in typography (e.g., font or case), physical characteristics of the stimulus (e.g., size), and modality (aural vs. visual). Jacoby and Hayman (1987) found, for instance, that changing typography at exposure and retrieval decreased performance on a word identification task compared to a match in typography (Madigan, McDowd, & Murphy, 1991; see Roediger & Blaxton, 1987 for similar effects). In addition, Weldon and Roediger (1987) demonstrated that prior exposure to a series of pictures resulted in greater priming effects when measured with a picture-naming task than with a word-fragment completion task, whereas the opposite was true for participants previously exposed to a series of words. Studies on the effects of modality changes on memory tasks have mainly used both aural and visual presentations during the exposure phase but only visual implicit memory tasks. Results showed greater priming effects on visual implicit memory tasks when the stimuli were visually presented in

the exposure phase, which indicates a same-modality effect on implicit memory tasks (e.g., Kelley, Jacoby, & Hollingshead, 1989; Rajaram & Roediger, 1993). Moreover, in their studies, Bassili, Smith, and MacLeod (1989) incorporated both visual and aural presentations of stimuli and a visual and aural word-stem completion task as a measure of implicit memory. It was demonstrated that using the same modality during exposure and memory tasks led to better performance on memory tasks than when modalities were altered.

Most research on modality congruence effects focused on implicit memory tasks measuring retention and recognition. To extend these findings, and using brands as stimulus material, the present studies focus on valenced responses. That is, on brand evaluations and choices after prior exposure. It is proposed that easier retention and recognition of a stimulus will lead to the experience of perceptual fluency, which will result in more positive evaluations of the stimuli (e.g., Winkielman et al., 2003). It is argued that the overlap in stimuli, situation, and cognitive processes (in the current studies: modality congruence), used during initial exposure to a brand name and the later evaluation of the brand name, will enhance perceptual fluency and therefore brand evaluations and brand choice (see Butler & Berry, 2001 for a related view). More specifically, it is hypothesized that modality congruence enhances perceptual fluency (Study 1) and subsequently has a positive influence on brand evaluation (Studies 2 and 3) and actual brand choice (Study 4).

Processing Style

As stated before, implicit memory tasks are strongly influenced by changes in physical features like modality (e.g., Vaidya et al., 1997). There are reasons to assume that the effects of modality congruence are not equally strong for all individuals in any given situation. The way in which stimuli are processed in the initial exposure phase seems to influence performance on implicit and explicit memory tasks (e.g., Craik, Moskovitch, & McDowd, 1994). In the present context, it would be plausible to expect greater effects of modality congruence when a person's attention in the exposure phase is explicitly drawn to the physical characteristics (e.g., modality) of the brand rather than the semantic meaning of the brand. In this context, two distinct but related processing styles are of relevance: data-driven processing and conceptually driven processing. Data-driven processing (also known as bottom-up processing) refers to detailed processing of mainly surface features of the stimulus. Moreover, data-driven processing is primarily concerned with recognizing and decoding the stimulus at hand without attributing meaning to it. Conversely, conceptually driven processing (also known as top-down processing) entails generating and elaborating information and knowledge related to the stimulus (Jacoby, 1983). This mode of processing relies heavily on existing schemata to form expectations of incoming information. We argue that the effects of modality congruence on brand evaluations are moderated by receivers' processing style (data-driven vs. conceptually driven) in the exposure phase. More specifically, the effect of modality congruence is expected to be stronger when

a person's attention in the exposure phase is explicitly drawn to the physical characteristics of the stimulus without attributing meaning to it. It is expected that the processing of physical features of the stimulus enhances perceptual fluency experienced when the modality at exposure and test are congruent. Conceptually driven processing will attract attention to information and knowledge that can be inferred from the stimuli, rather than the characteristics of the stimuli themselves, and is therefore expected to reduce the effect of modality congruence.

Overview of Studies

In a series of four studies, we examine the effects of modality congruence on perceptual fluency, brand evaluation, and brand choice. In Study 1 we show that brands are processed more easily when modalities between initial brand exposure and a subsequent brand recognition task either match or mismatch. Studies 2 and 3 focus on brand evaluation and the role of processing style in the effects of modality congruence. These studies demonstrate that same-modality priming leads to more positive brand evaluations than cross-modality priming and that this effect is more pronounced when the brands are processed in a data-driven as opposed to a conceptually driven manner. Finally, Study 4 extends the findings to actual advertising slogans and brand choice and shows that a brand is chosen more often when communication modalities between prior brand exposure (advertisement) and actual brand choice match. Our research contributes to the literature on modality effects in four key ways. First, although modality effects have been documented in the literature (e.g., Bassili et al., 1989; Kelley et al., 1989; Rajaram & Roediger, 1993), studies have typically focused on recall as a dependent variable. The present research extends these findings by demonstrating the far reaching effects of modality (in)congruence on evaluative responses such as attitudes and preferences. Second, we show that modality congruence may affect overt choice behavior in addition to these valenced responses. Third, our work contributes to extent literature by proposing and testing the role of an as yet unexplored factor that modulates the effects of modality congruence. Across our studies we demonstrate that differences in trait and state processing style are a critical moderator of the congruence effect. Finally, the "theatre of operations" that is featured in our studies, consisting of (commercial) communications and recipient (consumer) behavior, increases the relevance of our findings not only for more fundamental but also for more applied fields.

Study 1

The first study was designed to examine the effects of modality congruence on perceptual fluency. It was hypothesized that brands are recognized more easily, and therefore processed more fluently, when there is congruence (vs. incongruence) between modalities during prior exposure and during the recognition task.

Method

Design and participants. Study 1 used a single factor between-subjects design (modality: same-modality vs. cross-modality). A total of 77 undergraduate students (29 male and 48 female) were randomly assigned to the same-modality or cross-modality condition. Their mean age was 21.49 years ($SD = 2.20$). Participants received 6 Euros or research credits to fulfill their research participation requirements. Note that before data collection, the procedure of each study was assessed and approved by an ethics committee. This committee judges experimental procedures on factors including "duration of research," "type of research," and "potential harm for participants." The experimental procedure was approved on all criteria. In addition, before the experiment, participants completed an informed consent form.

Procedure. The experimenter led participants to individual cubicles with a computer where they were told that they would participate in a sequence of unrelated studies. First, participants responded to some demographic questions after which they were aurally or visually exposed to a series of words and brand names. After an extensive filler task, participants performed a visual or aural version of a brand decision task that served as a measure of perceptual fluency.

Modality. Participants in the same-modality condition were assigned to a brand decision task that matched the modality of the exposure phase. More specifically, in this condition, participants who were visually exposed to the words and brands completed a visual version of the brand decision task, and participants who were aurally exposed to the words and brands completed an aural version of the brand decision task. In contrast, participants in the cross-modality condition who were visually exposed to the words and brands completed the aural version of the brand decision task, and participants who were aurally exposed to the words and brands completed the visual brand decision task.

Brand exposure phase. In the brand exposure phase, participants were exposed to a total of 40 words. They were informed that the researchers were interested in how individuals process different types of words. Ten of the 40 words were the target brands and were familiar brand names (e.g., Prada, Mars, Dove). Fifteen filler brand names (e.g., Fristi, Adidas, and Vogue), and 15 randomly chosen words (e.g., beach, tree, and windowsill) served to distract participants from the actual goal of the experiment. Participants in the aural brand exposure condition heard each word once through a headphone. On average this took 3 seconds. The words in the visual brand exposure condition were each displayed on the computer screen for 3 seconds to keep the duration of exposure constant over the different conditions.

Brand decision task. To measure perceptual fluency, we created a brand decision task based on a standard lexical decision task (Meyer & Schvaneveldt, 1971), which has been used extensively to measure concept activation and fluency. In this task, participants had to indicate as quickly and as accurately as possible (by pressing the "a" or ";" key, respectively) whether the word presented was an existing brand name

or not. Participants were presented with a total of 40 words of which 10 were the target brands from the exposure phase, 10 were filler brand names (other filler brands than in the exposure phase), and 20 strings of letters were nonexisting words. In the visual brand decision task, all words were preceded by a series of Xs. A separate pretest revealed that participants felt most comfortable with a fixation duration of 3 seconds. Hence each row of Xs was shown for 3 seconds. Each word remained on screen until participants had decided whether the word was an actual brand name or not. In the aural version of the brand decision task, participants heard each word once and then had to indicate whether or not the brand was an existing one. All aural exposures were preceded by a pause of 3 seconds to keep the duration constant. The mean standardized response time on the 10 target brands served as our measure of perceptual fluency.

Results and Discussion

Response times below 300 milliseconds or above 3,000 milliseconds were removed as well as the response times on trials in which an incorrect answer was given (5%; see Fazio, 1990). To control for any differences in the type of brand decision task (visual vs. aural), all response times were transformed to *z* scores. In order to test the hypothesis that same-modality priming leads to more perceptual fluency than cross-modality priming, we performed an ANOVA on the mean response time on the target brands. The results demonstrated that participants in the same-modality condition responded faster to the target brands ($M = -.20$, $SD = .67$) than participants in the cross-modality condition, $M = .19$, $SD = .94$; $F(1, 75) = 4.56$, $p < .05$, $\eta_p^2 = .06$. This indicates that brands are processed more fluently when modalities are congruent, a finding that is in line with previous research (e.g., Bassili et al., 1993). Hence it can be concluded that individuals process a brand name more easily when the modality of the brand exposure matches the modality of the recognition task. The next experiment extends this finding to brand *evaluation*, whereby it is argued that modality congruence positively affects brand evaluations. Furthermore, it is expected that the effect of modality congruence is stronger when participants adopt a data-driven processing style (vs. a conceptually driven processing style) because this style is primarily concerned with processing surface features (such as modality) of the stimulus without generating additional knowledge related to the stimulus.

Study 2

The present study was designed to test the proposition that same-modality brand priming leads to more positive brand evaluations than cross-modality brand priming. In addition, it was expected that this effect is more pronounced when participants adopt a data-driven processing style as opposed to a conceptually driven processing style.

Method

Design and participants. To test the hypotheses, we used a 2 (modality: same modality vs. cross-modality) × 2 (processing style: data-driven vs. conceptually driven) between-subjects design. One hundred and fifty-four undergraduate students (58 male and 96 female), with a mean age of 20.2 years ($SD = 2.1$), participated in this experiment. Participants either received research credits to fulfill their research participation requirement, or 6 Euros for their attendance.

Procedure. On arrival at the lab, the experimenter informed the participants that the study would consist of several unrelated studies and subsequently led them to a room with a computer that provided all further instructions. After responding to a number of demographic questions, participants were visually or aurally exposed to a series of brand names and were randomly assigned to the conceptually driven condition or the data-driven condition. A visual versus aural brand evaluation scale was used to measure participants' attitudes toward the previously exposed brands. An awareness check was used to ascertain that nobody had identified the true goal of the experiment. Finally, participants were paid and thanked for their participation.

Modality. Similar to study 1, participants in the same-modality condition were assigned to the brand evaluation task that matched the modality of the brand exposure phase, and participants in the cross-modality condition responded to the brand evaluation task that mismatched the modality of the brand exposure phase.

Processing style. Data-driven processing was induced using a procedure designed by Chung and Szymanski (1997). In more detail, we asked participants to count the number of syllables of each of the brand names they were exposed to. This task directs participants' attention to the physical and surface features of the stimuli. In contrast, conceptually driven processing was induced by having participants indicate at which time of the day (morning–afternoon–evening–night) they were most likely to use each brand. This instruction directs participants toward processing the brand names at a conceptual level by elaborating on brand knowledge and features of the product usage situation (see also Leshner & Coyle, 2000 for a similar procedure).

Brand exposure. In the brand exposure phase, participants were either visually or aurally exposed to a total of 40 brand names. Ten of these brand names were target brands and the remaining 30 were filler brands to obscure the real objective of the experiment. All of the target brands were existing and familiar (e.g., Extran, Puma, and Armani) and covered different product categories. In the aural exposure condition, participants heard each brand name twice with a pause of 0.5 seconds in between (see Butler & Berry, 2001). After participants counted the number of syllables or indicated what time of the day they were most likely to use the presented brand, the next one was presented. In the visual exposure condition, the brand name remained on screen until participants had either indicated how many syllables it consisted of or had answered when they were most likely to use the brand. After responding to this question, the next brand automatically emerged on the screen.

Mood. As a confound check to measure whether the brand exposure phase, the processing style induction, or the interaction between these variables would lead to

unintended mood effects, participants completed the Positive and Negative Affect Schedule (PANAS; Watson, Clarke, & Tellegen, 1988). We adopted this measure because it could be argued that being aurally rather than visually exposed to the brands could lead to unintended mood effects, which could operate as a design confound in the present study. Hence the mood measure served as a confound check. The PANAS questionnaire is designed to measure participants' mood state at a particular point in time and consists of 10 positive ($\alpha = .86$) and 10 negative items ($\alpha = .79$). This questionnaire, together with an extended irrelevant personality questionnaire, also functioned as a filler task to blur the relation between the brand exposure phase and the brand evaluation task.

Brand evaluation task. Participants were either exposed to the visual or the aural version of a brand evaluation task. In both versions, participants saw or heard 28 brands of different product categories. Ten of these brands were the target brands from the brand exposure phase, the remaining 18 brands served as filler-items and differed from the filler brands used in the brand exposure phase. In the visual version of the task, participants saw the brand names (one at a time) and rated on a 5-point semantic differential scale how positively versus negatively they rated each of the brands. The next brand emerged after participants had given their opinion of the brand on the screen. Participants who received the aural version of the task completed the same task with the difference that they *heard* each brand twice (with a pause of 0.5 seconds in between; Butler & Berry, 2001). The response options appeared on the screen after the aural exposure of the brand, and the next brand was presented after participants had responded. Given the large number of brand ratings, we included the one- rather than multi-item measure to prevent boredom and response biases. Moreover, recent research indicates that one-item measures frequently perform as satisfactorily as multi-item measures (Bergkvist & Rossiter, 2007). An index of brand evaluations was created by summing the ratings on the 10 target brands.

Results and Discussion

Mood. An ANOVA on the positive items and the negative items of the PANAS indicated that mood states were not affected by the brand exposure phase, processing style manipulation, or the interaction between brand exposure and processing style (all Fs < 1). Thus mood states cannot account for any effects on brand evaluation.

Brand evaluation. To test the hypothesis that same-modality priming leads to more positive brand evaluations than cross-modality priming, particularly for participants in the data-driven processing condition, a full factorial ANOVA was conducted on the brand evaluation scale.

The results yielded the expected significant interaction effect between modality and processing style, $F(1, 150) = 4.67$, $p < .05$ $\eta_p^2 = .03$. The interaction effect indicated that the modality manipulation particularly affected brand evaluations among participants in the data-driven condition rather than among participants in the conceptually driven condition. Simple main effect analyses revealed that participants in the data-driven condition evaluated the brands more positively in the same-modality

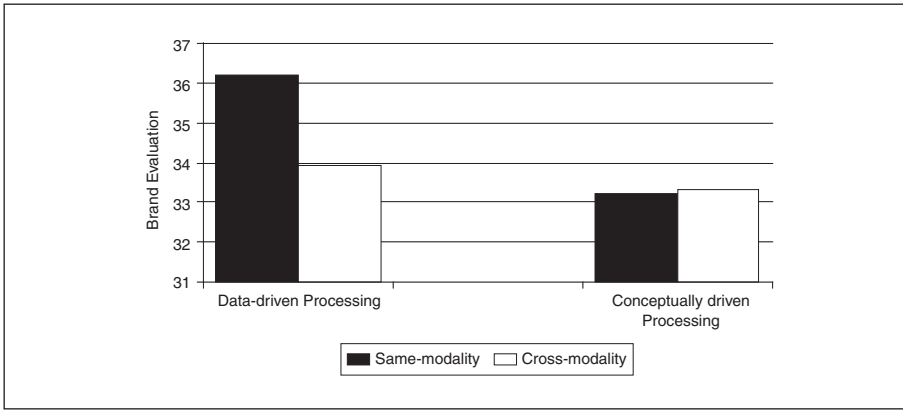

Figure 1. Brand evaluation as a function of communication modality and processing style

condition, (M = 36.2, SD = 3.09), than in the cross-modality condition, (M = 33.95, SD = 2.96) $F(1, 150) = 8.73$, $p < .01$, $\eta_p^2 = .06$. Participants in the conceptually driven condition did not show such an effect, (M = 33.24, SD = 3.79 vs. M = 33.31, SD = 3.4) $F < 1$ (Figure 1).

In addition, the analysis yielded main effects of modality, $F(1, 150) = 4.11$, $p < .05$, $\eta_p^2 = .03$, and of processing style, $F(1, 150) = 11.3$, $p < .01$, $\eta_p^2 = .07$). The effect of modality indicated that when the modalities in the exposure phase and the evaluation task match (same-modality), participants evaluated the brands more positively (M = 34.66, SD = 3.76) than when there was no such match (cross-modality), M = 33.64, SD = 3.18. Furthermore, the main effect of processing style showed that participants in the data-driven condition rated the brands more positively (M = 34.97, SD = 3.21) than participants in the conceptually driven condition (M = 33.27, SD = 3.57).

These results support our hypotheses by demonstrating that same-modality priming affects brand evaluations positively but primarily under conditions of data-driven processing. As opposed to cross-modality priming, same-modality priming seems to enhance perceptual fluency by easier retention of the brand. Moreover, the results suggest that the effects of modality congruence are stronger when participants are instructed to pay attention to physical features by inducing a data-driven processing style than when participants adopt a conceptually driven processing style. Hence attention to physical features of the stimuli seems to be required to obtain benefits from modality congruence. Altogether, the findings provide supporting evidence for the notion that brand evaluations depend on the interaction between communication modality used for advertising and the communication modality at the brand evaluation setting. In the present study, we used an explicit processing manipulation: Participants were explicitly asked to count the number of syllables a brand entails (data-driven

processing) or to think about the time of day they regularly use the particular brand (conceptually driven processing). In addition, to enhance the generalizability of our findings, it is of interest to identify more ecologically valid situations in which consumers generally and automatically adopt a particular processing style when seeing or hearing a persuasive message. It is plausible to expect that new information, as opposed to familiar information, is processed more extensively in a data-driven manner because new information has no related associations and knowledge stored in memory that could enhance a conceptually driven processing style. Indeed, research on the so-called "pioneering advantage" has underscored that information about new brands is processed more extensively than information about existing brands because such information is potentially relevant and not yet available in consumer memory (see Kardes & Gurumurthy, 1992). For the present context, this would imply that new brands are automatically processed in a data-driven manner because there are no schemata concerning these brands available in memory. Therefore, it is argued that the effects of modality congruence are especially important when consumers encounter a new as opposed to a familiar brand because these brands are more likely to induce a data-driven processing style. Accordingly, Study 3 will test the hypothesis that the effects of modality congruence are stronger for new brands than for familiar ones.

Study 3

The aim of the present study is to examine the effects of modality congruence for new versus familiar brands. It is hypothesized that the effect of modality congruence on brand evaluation is stronger for new as opposed to familiar brands because new brands are expected to induce a data-driven processing style. As became apparent in the second study, a data-driven processing style was shown to increase the effects of modality congruence. Based on the perceptual fluency account (i.e., familiar stimuli induce positive evaluations) we expect an overall main effect of brands such that familiar brands are rated more positively than unfamiliar new ones because familiar information is generally processed more easily than new information (Jacoby & Dallas, 1981). However, we argue that the processing of new information (vs. familiar information) can benefit from modality congruence because new information is proposed to induce a data-driven processing style. Hence it is expected that new brands will be rated more positively when modality is congruent versus incongruent, because the congruence in modality at exposure and evaluation will induce more perceptual fluency than a situation of incongruence.

Method

Design and participants. We used a 2 (modality: same-modality vs. cross-modality) × 2 (brands: new brands vs. familiar brands) design with modality as between-subjects factor, and brands as within-subjects factor. Participants comprised 76 undergraduate students (28 male and 48 female), with a mean age of 21.22 years (SD = 2.23). They

received research credits to fulfill their research participation requirement or 6 Euros for their participation.

Procedure. When participants arrived at the lab, they were seated in individual cubicles equipped with a computer that provided further instructions. First, participants had to respond to demographic questions before being visually or aurally exposed to a series of familiar and new brands. Next, participants completed a filler questionnaire to obscure the real goal of the study. After this filler task, participants responded to either a visual version or an aural version of a brand evaluation task. At the end of the experiment, participants were rewarded, debriefed, and thanked for their attendance.

Modality. As in the previous studies, participants in the same-modality condition were assigned to the brand evaluation task that matched the modality of the exposure phase, and participants in the cross-modality condition were assigned to the brand evaluation task that mismatched the modality of the exposure phase.

Brand exposure phase. We first conducted a pretest ($N = 20$, 12 male) to confirm (a) that the experimental "familiar" brands were indeed well-known and established and (b) that our (fictitious) "new" brands were indeed judged as unfamiliar unknown brands. Participants were exposed to a list containing the six target brands (three actual brands and three fictitious brands) and were asked to indicate whether or not they were familiar with the presented brands. As expected, the results demonstrated that the participants were indeed all acquainted with the familiar brands (i.e., they indicated that they knew the brands), whereas none of the participants indicated to be familiar with the fictitious brands (i.e., they did not mark these brands as familiar). Hence the chosen and "created" brands are suitable for the purpose of this study. Participants were either visually or aurally exposed, on a random basis, to 30 brand names. In total, there were 6 (pretested) target brands of which 3 were real and familiar and the other 3 were fictitious (and hence new and unfamiliar).

Participants were told that they would be exposed to 30 brand names and that some of them might seem more familiar than others because a number of the brands were new or foreign. The remaining 24 brands (12 familiar and 12 new) served as filler items. In the aural exposure condition, participants heard each brand once, which took on average 3 seconds. To keep the duration constant, the brands in the visual exposure condition were also displayed for a period of 3 seconds each.

Brand evaluation task. Participants completed either the visual or the aural version of the brand evaluation task. In both conditions participants rated a total of 30 brands. Six of these brands were the target brands from the exposure phase (3 familiar and 3 new brands). The remaining 24 brands served as filler items and differed from the filler brands that had been used in the exposure phase. Participants rated on 5-point scales how positively versus negatively they evaluated each of the brands. The procedure of the visual and the aural brand evaluation task was exactly the same as the one used in study 2. The scores on the 3 familiar brands were summed up and served as a measure of familiar brand evaluation, whereas the summed scores on the new brands served as a measure of new brand evaluation.

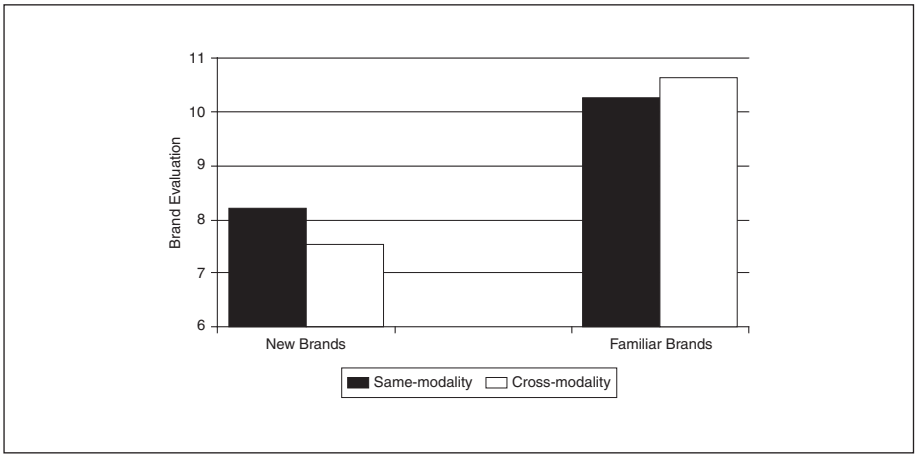

Figure 2. Brand evaluation as a function of communication modality and brand type

Results and Discussion

Brand evaluation. To test the hypothesis that modality congruence effects are stronger for new brands than for familiar ones, we conducted a 2 (modality: same-modality vs. cross-modality) × 2 (brands: new brands vs. familiar brands) ANOVA with repeated measures on the last factor.

Most important for the current hypotheses, the results yielded a significant interaction effect between modality and brands, $F(1, 74) = 4.68$, $p < .05$, $\eta_p^2 = .06$. Analysis of the simple main effects revealed that the new brands are rated more positively by participants in the same-modality condition ($M = 8.22$, $SD = 1.44$) than by participants in the cross-modality condition ($M = 7.51$, $SD = 1.59$) $F(1, 74) = 4.09$, $p < .05$, $\eta_p^2 = .05$. This pattern of results was not found for the familiar brands, ($M = 10.27$, $SD = 1.63$ vs. $M = 10.64$, SD 1.99) $F < 1$ (see Figure 2).

In addition, we found a main effect of type of brands, $F(1, 74) = 108.98$, $p < .001$, $\eta_p^2 = .60$, indicating that the familiar brands were rated more positively ($M = 10.46$, $SD = 1.82$) than the new brands ($M = 7.86$, $SD = 1.55$). This result is in line with the perceptual fluency account which states that familiar stimuli are processed more easily and are therefore rated more positively.

The results of the present study provide additional support for our hypotheses that modality congruence leads to more favorable brand evaluations when the brands are processed in a data-driven manner. It was found that modality congruence enhances perceptual fluency for new brands but not for familiar brands. This finding illustrates that ecologically valid conditions exist where individuals automatically adopt a data-driven processing style that leads to a greater effect of modality congruence. Study 4 will examine whether the effects of modality congruence can be upheld in a situation

in which actual advertising slogans, instead of mere brand names, are used. Moreover, the next study will include an actual brand choice situation.

Study 4

The present study aimed to extend the previous findings in three different ways. First, we added a control condition to the design in which participants were not exposed to the target brand. This enabled us to compare the effects of same- and cross-modality priming with a situation where there was no priming at all. Second, to externally validate the foregoing results, we used actual, real-life advertising slogans to mimic a more "real world" situation. Finally, by using actual brand choice as the dependent variable, we tested whether the previously found modality effects carry over to affect overt consumer behavior. As the results of the previous studies indicate that modality effects are stronger when the stimuli are processed in a data-driven manner, we will only apply a data-driven processing induction in this study.

Method

Design and participants. This experiment employed a single factor between-subjects design (modality: same-modality vs. cross-modality vs. control). One hundred and twenty-eight undergraduate students (41 male and 87 female) with a mean age of 20.83 years (SD = 3.15) participated in the experiment. Participants were randomly assigned to either the same-modality, cross-modality, or control condition and received research credits to fulfill their research participation requirement or 6 Euros for their attendance.

Procedure. As in the preceding studies, participants were told that the study consisted of several unrelated parts. Participants first responded to some demographic questions and were subsequently presented, either visually or aurally, with a series of advertising slogans. In line with study 2, all participants were instructed to count and report the total number of words used in each slogan. We slightly adjusted the task to make it fit the material (advertising slogans) of the present study. In the present study, participants are exposed to advertising slogans (rather than mere brand names) consisting of several words (ranging from 4 to 8 words), whereas brand names are typically single words. Counting syllables (as in Study 2), rather than words, would pose a more challenging and mentally taxing task to the participants, which could adversely affect the results. Nevertheless, the task is conceptually the same as the one in Study 2 in that it requires participants to focus on the perceptual (rather than conceptual) features of the brand/slogan. Only one brand served as the target brand (in the control condition, participants were not exposed to this brand). The brand exposure phase was followed by a mood questionnaire. At the ostensible end of the experiment, participants were either visually or aurally confronted with an actual brand choice situation.

Modality. Participants in the same-modality condition who were visually exposed to the advertising slogans were confronted with the visual choice option, and participants who were aurally exposed to the advertising slogans were presented with the aural choice option. In contrast, participants in the cross-modality condition were presented with the brand choice in a way that was incongruent with the modality in which they were previously exposed to the advertising slogans. In the control condition, half of the participants were aurally and half were visually exposed to the advertising slogans and were approached either with the visual or the aural brand choice. Note that participants in the control condition were previously not exposed to the target brand.

Brand exposure phase. Participants were exposed to a total of 30 different existing advertising slogans. Only advertising slogans that had both a visual (in magazines and billboards) and an aural version (on the radio) were chosen as stimulus material. The aural advertising commercials were edited in such way that the content of the slogan was exactly the same as in the visual advertisement. In each of the slogans a different brand name was present. Only one of the brands (a candy bar) served as the target brand; all other brands were used as fillers to disguise the real purpose of the experiment. In the control condition, participants were not exposed to the slogan that contained the target brand. As in study 2, in the aural condition, participants heard each slogan twice (with a pause of 0.5 seconds in between; Butler & Berry, 2001). After participants had reported the number of words in the slogan (inducing data-driven processing), the next brand emerged. In the visual exposure condition, the advertising slogan remained on screen until participants had indicated how many words the slogan contained. The next brand appeared after responding to this question. In the control condition, half of the participants were visually exposed to the advertising slogans and half were aurally exposed.

Mood. Similar to study 2, to measure whether the advertising slogan manipulation would lead to unintended mood effects, participants responded to PANAS (Watson et al., 1988). This questionnaire measures participants' current mood state and entails 10 positive items ($\alpha = .84$) and 10 negative items ($\alpha = .82$).

Brand choice. Actual brand choice was measured when participants were asked, after the ostensible end of the experiment, whether they would like a candy bar (as an expression of gratitude for participating in the study). Participants had a choice of three different bars, one of which corresponded with the target brand. In the visual condition, the candy bars were displayed on the experimenter's table and participants were told to take one of the candy bars if they wanted. Participants in the aural condition were asked whether they would like a candy bar and the available candy bars were listed (in a random order) by the experimenter. Subsequently, the experimenter took the chosen candy bar out of a closed box and gave it to the participant. The percentage of participants choosing the target brand served as the dependent variable.

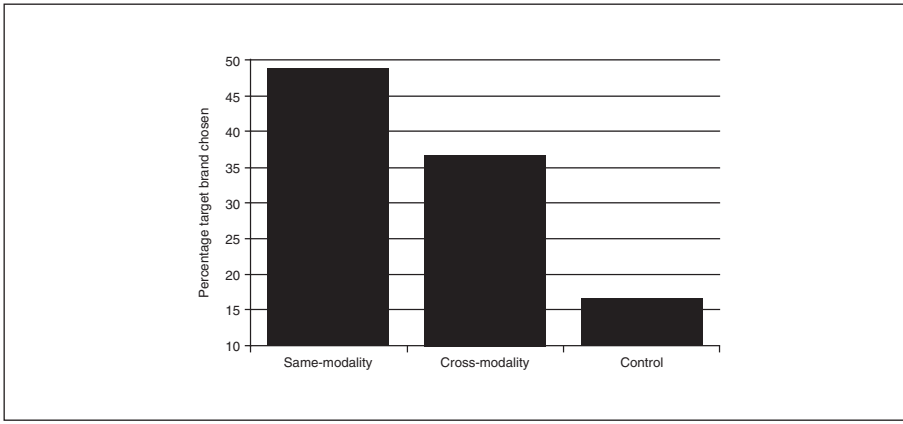

Figure 3. Target brand chosen as a function of communication modality

Results and Discussion

Fifteen participants refused a candy bar and were thus excluded from the data analyses. A total of 113 participants (41 males and 72 females), with a mean age of 20.83 years ($SD = 3.15$), remained in the analysis.

Mood. An ANOVA on the positive items of the PANAS indicated that the brand exposure phase had no effect on positive mood states, $F(1, 110) = 2.7$, *ns*. Likewise, an ANOVA on the negative items of the PANAS showed no effect for negative mood ($F < 1$). Hence mood states cannot account for the difference in brand choice.

Brand choice. To examine the effects of modality congruence on brand choice, we performed a logistic regression with brand choice (target brand = 1, other brands = 0) as the dependent variable, and modality as our independent variable. The results showed a significant difference between the different modality conditions, Wald(1) = 7.69, $p = .006$, $R^2 = .10$. In the same-modality condition, 48.8% of all participants chose the target brand; in the cross-modality condition, 36.6% chose the target brand; and in the control condition, only 16.6% of the participants chose the target brand (Pearson's chi-square = 8.27, $p = .016$; see Figure 3). Note that the target brand was only chosen by 16.6% of our participants in the control condition. This percentage is smaller than would be expected by chance. Hence it seems that the target brand was, in general, less desirable than the other brands. However, this does not pose a threat to our results since a substantial larger amount of participants in the same-modality and cross-modality conditions *did* opt for the target brand. Hence the relative differences between the different conditions in line with our hypotheses were still observed.

These results corroborate and extend the findings found in the previous studies by showing that modality congruence not only has an effect on brand evaluations but also on actual brand choice. Moreover, these results were obtained by using actual advertising slogans instead of mere brand names.

General Discussion

Across 4 studies, evidence was obtained for the notion that perceptual fluency effects (e.g., Seamon et al., 1983) on brand evaluation and choice are stronger under conditions of same-modality priming as opposed to cross-modality or no priming. Study 1 showed that modality congruence has an effect on perceptual fluency in such a way that individuals respond faster to a brand name in a situation of same-modality versus cross-modality priming. Studies 2 and 3 revealed that same-modality priming, compared to cross-modality priming, has a positive influence on brand evaluations. Moreover, these studies showed that these effects are stronger under conditions of data-driven processing as opposed to conceptually driven processing. In accordance with these findings, study 4 demonstrated that the effects of modality congruence can be upheld in a situation in which actual brand choices are made and actual advertising slogans served as primes. Together, these results indicate that consumer responses are influenced by the interaction between advertising modality and the modality in which consumers encounter the brand again while forming their evaluations and making their decisions.

According to the perceptual fluency account, the fluency of a stimulus can be enhanced by prior exposure, which in turn leads to more favorable evaluations toward the stimulus. Thus (repeated) advertising exposure decreases processing demands during the recognition and identification of the advertised brand in an (un)related situation. This experienced fluency subsequently positively affects brand evaluations and enhances the chance of being chosen. We proposed that matching communication modalities between encoding (i.e., advertising) and retrieval (evaluation situation) can enhance perceptual fluency, which consequently positively influences brand evaluations and brand choices. The present results are consistent with this hypothesis: brands are rated more positively and have a greater chance of being chosen when they are advertised and evaluated in the same modality than when modality differs across both situations. These results are compatible with the Encoding Specificity Principle (Tulving & Osler, 1968, see also Kardes, 2001) and the Transfer Appropriate Processing model (TAP; see Blaxton, 1989; Bransford, Franks, Morris, & Stein, 1979). The Encoding Specificity Principle states that stimuli are best remembered and recalled when the physical features at the exposure phase (during encoding) are similar to the features at retrieval. In addition, the TAP-model emphasizes that matching cognitive demands during exposure (i.e., learning) and retrieval leads to better performances on implicit memory tasks than a mismatch. Together, these implicit memory models indicate that a stimulus is more easily retrieved when there are no differences in stimulus-features, situation, and cognitive processes (e.g., seeing or hearing) involved in the exposure and retrieval phase. Research on the preceding implicit memory models has frequently focused on retrieval and recognition (e.g., Fisher & Craik, 1977; Tulving & Thomson, 1973). The current research extends these findings to evaluation and choice (see also Janiszewski & Chandon, 2007). Accordingly, the present results show that evaluations were positively affected when the stimuli and situation during exposure

and task had exactly the same features. Moreover, when the cognitive process required at exposure (hearing or seeing) matched the process required in the evaluation phase (hearing or seeing), brands were processed more fluently (Study 1), rated more favorably (Studies 2 and 3), and chosen more often (Study 4).

In the present studies, we assessed brand evaluation by means of a single-item measure. Although Bergkvist and Rossiter (2007) argue that single-item measures often have the same predictive validity as multiple-item measures of attitude, it would be interesting to adopt a multiple-item measure making it possible to differentiate between different dimensions of the brand evaluation construct. It could be argued, for example, that the brand evaluation construct consists of both cognitive and affective dimensions. A multiple-item measure could therefore be used to tap into these kinds of different dimensions resulting in a more valid and reliable measurement. However, for the current studies, the reliability and validity of the observed findings are not only strengthened by the results of Bergkvist and Rossiter (2007) but also by the findings of our final study in which the preceding results are replicated while using a behavioral outcome measure. On the whole, our studies have shown a consistent and similar pattern of results regardless of the employed measure.

In future research, it would be interesting to make a distinction between perceptual and conceptual fluency. The present studies focused on perceptual fluency but recent research has also investigated the effects of conceptual fluency (which is primarily based on the meaning of a stimulus) on attitudes (e.g., Lee & Labroo, 2004). It could be argued that modality-effects are reduced when one experiences conceptual fluency instead of perceptual fluency because conceptual fluency seems to demand attributing meaning to a stimulus that appears to reduce modality congruence effects (see Winkielman et al., 2003, for a detailed distinction between perceptual and conceptual fluency).

Studies 2 and 3, in particular, showed that processing style is an important factor in the relation between modality congruence and brand evaluations. It appears that data-driven processing, as compared to conceptually driven processing, enhances the relationship between modality congruence and evaluations. This result was obtained by using an explicit processing style manipulation (Study 2) and by using new versus familiar brand names (Study 3). The modality congruence effect appeared more pronounced when participants' attention was explicitly drawn to physical features (by counting the syllables) and by exposure to new as opposed to familiar brands. New brands seem to automatically induce a data-driven processing style because no schema-based expectations are activated when processing new information. Hence we uncovered a stimulus feature that intensifies the effects of modality congruence. The kind of information one is exposed to (in these studies new or familiar), seems to qualify the effects of modality congruence. Given this finding, it would also be interesting to reveal which personality traits and situational characteristics (automatically) facilitate data-driven processing. From the literature we know, for instance, that a person's mood can lead to different processing styles (e.g., Bless, Bohner, Schwarz, & Strack, 1990; Hullett, 2005). A positive mood can be associated with conceptually

driven processing, whereas a negative mood is associated with data-driven processing. Consequently, this could mean that the effects of modality congruence are stronger under negative mood conditions.

Given the notion that consumer preferences and choices are generally not well-defined but formed during the process of making a choice (i.e., "constructed preferences"; see Novemsky, Dhar, & Schwarz, 2007), the present findings have important implications for the advertising domain. The idea of constructed preferences implies that different contexts and tasks can affect which aspects of an object or option are highlighted during evaluation and choice. The metacognitive experience of perceptual fluency (enhanced by modality congruence) seems to influence brand evaluations and choices in a similar manner. The fluency that is experienced during brand evaluation and brand choice (i.e., during preference construction) appears to positively influence evaluations and choice. Therefore, when developing advertising strategies, it seems beneficial to bear in mind the contexts and circumstances in which consumers make their decisions. More central to the current findings, when choosing advertising strategies (for instance, between an aural or visual advertisement), it would seem profitable to consider in what modality consumers are most likely to encounter the advertised brand again. Based on the present results, the most advantageous would seem to use visual advertisements for products sold in, for example, a supermarket where products are generally displayed visually. Aural commercial messages, on the other hand, seem best suited for products that are sold in interpersonal selling situations in which it is most likely for consumers to hear the brand name again. Processing style also appears to be an important factor in predicting the effects of communication modality. Particularly, the evaluation of new brands seems to be influenced by modality congruence, which makes modality considerations especially relevant when launching a new brand.

In addition, from both a practical and a theoretical perspective, it would be interesting to examine the effects of multimodality commercial messages, that is, a message with both visual and aural features. Research on memory for television messages, for instance, has mainly focused on audio/video redundancy effects. In these studies, it is typically found that memory for messages is better when the audio and video messages are redundant as compared to dissonant (Brosius, Donsbach, & Birk, 1996; Fox, 2004; Lang, 1995). From a modality congruence perspective, it is important to investigate whether brands presented in multimodality messages thrive best in an evaluation or choice situation in which both features are present. We expect that they would (e.g., a store with ample display facilities and active sales representatives). Hence these findings might be profitable for "point-of-purchase" (POP) communications, which entail such aspects as packaging, product presentation, and different dimensions of store atmosphere (e.g., visual, aural, olfactory, and tactile). Matching these POP-communication strategies with the communications strategies in advertisements appears to be beneficial to brand evaluations and choices.

Altogether, the present research provides promising evidence for the notion that perceptual fluency profits from congruence in communication modality and offers new insights into the interaction between advertising modality and the modality of the purchase situation.

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