The impact of musical fit and sound design on consumers' perception of a car ad

ABSTRACT

A study is reported that was designed to investigate the influence of various kinds of sonic accompaniment on consumers' perception of a high-end luxury sports car. Using a between-participants experimental design, groups of 40 participants viewed a short car ad. The groups heard either classical music, pop music, sound effects, or listened in silence. The results revealed that participants perceived the car's power, driving excitement and engine technology to be highest when the ad was paired with sound effects. Meanwhile, participants perceived the car to be most elegant and indicated the highest price for the car when the ad was paired with classical music. Those participants who watched the ad in silence rated lowest for all aspects of the car's characteristics, including indicating the lowest price for the car. Interestingly too, participants admitted that music/sound effects influenced their perception for the advertised luxury sports car. This implies that specially curated sound design is necessary to highlight specific characteristics of a car.

KEYWORDS: MUSICAL FIT; SOUND EFFECTS; ADVERTISING; LUXURY.

The sports car segment of the car market accounted for 3.1% of the worldwide revenue in 2021 (Sports Car Report, 2022). Furthermore, the global market for sports cars is expected to grow over the next five years, with an expected projection in revenue from US$65,600 million in 2023 to US$72,760 million by 2027 (Statista, 2022). Among the prominent key market players in the sports car division include the Ford Motor Company, AUDI, AG, BMW AG, Ferrari, McLaren Group, Porsche and Acura (Knowledge Sourcing Intelligence,

2022). Sales of Ferrari cars, the car brand studied in the present study, has been on the rise with a total sales net profit of US$225 million in the 3rd quarter of 2022, representing an increase of 10% from the same quarter the previous year (TechXplore, 2022). Much of this increase was attributable to the demand for Ferraris in mainland China, Hong Kong, and Taiwan. There the market grew by 73.1%, from 249 units in the 3rd quarter of 2021, to 431 units in the same quarter of 2022 (see Ferrari, 2022). According to a market research report, the motor vehicle manufacturing industry stands as one of the most important economic sectors in Italy, as reflected by its 6.2% contribution to the Italian GDP (Ibis World, 2022). Depending on the model in question, an average Ferrari car can cost anywhere between US$200,000 and US$400,000. Such a high-value purchase therefore acts as a Veblen good (Veblen, 1899), and it represents exclusivity and a luxury that few are able to afford. As a result, Ferrari's advertising team go to great lengths in curating car ads that would define the characteristics of each model (Ferrari, 2023). The purpose of this study was therefore to investigate whether music and/or sound design would be able to influence consumers' perception of a Ferrari car (as a distinctive example of a luxury brand).

The earliest known car ad appeared in a North American magazine on July 30th, 1898 by Winton Motor Carriage, which carried the title 'Dispense with a horse' (Borroz, 2009). The ad itself was quite straightforward, talking about the benefits of the car. With advances in car manufacturing in the early 20th century, car ads became bolder and brighter, featuring beautiful women and animal prints; and these ads targeted the wealthiest members of society (see Steel, 2021). Alongside the digital revolution of the 21st century, advertising and marketing have gained much ground in cyberspace. The use of music and motion are carefully crafted to heighten desire and affect consumers' emotional responses. Nowadays, a car represents a lifestyle choice, social status, as well as a desire for comfort and luxury (Ahmad, 2021). Considering the cost of owning (and maintaining) a car, and in spite of a

plethora of car ads, there has been little empirical data and research to date on the effects of music and sound design in car ads.

Music and Sound Design in Car Ads

The use of classical music in ads have always denoted luxury, affluence and class (Yeoh & North, 2010). The theory of musical fit states that music with characteristics that correspond to the central brand message of a particular product should prime relevant beliefs about the product (Yeoh & North, 2013). For example, Areni and Kim (1993) found that customers in a wine cellar spent more when classical music rather than top 40 music was played, arguing that classical music stereotypically primed wealth and affluence, resulting in customers spending more (see also North et al., 2003; Yeoh & Spence, in press). Musical fit is thought to operate by raising the salience of items by priming related concepts in memory. Once primed, these concepts appear to influence product perception and 'guide' purchasing behaviour (North et al., 2016; Yeoh & Allan, 2020; Yeoh & North, 2010).

Since classical music denotes affluence and class, luxury cars have often been paired with classical music. One example of this is the ad for the Lexus NX 2014 commercial which made use of the 2nd movement from Mozart's Piano Concerto no.21, K. 467 (Tormes, 2014), depicting a sense of calm as the car slowly rolls into a lush green forest (see also Audi R8's car ad which made use of Ravel's *Jeux d'eau*). Since classical music mood ranges from the calm (e.g., Beethoven's Moonlight Sonata) through to mania (e.g., Rimsky Korsakov's Flight of the Bumble Bee), instances of car ads using the latter can be found in ads that depict speed and power. Examples of this can be seen in the 2018 Jaguar E-PACE SUV (JaguarNederland, 2018) which made use of Vivaldi's 'La Folia' (or in English 'folly' or 'madness') from Sonata no. 12 in D minor; and BMW's 2007 ad which made use of Beethoven's *Molto Vivace* from Symphony no. 9 (J4MB0, 2007). The music's frenzied pace fitted well with the

visuals of a vehicle navigating an urban landscape. Meanwhile, Wagner's 'The Ride of the Valkyries' has been used in a Nissan Juke ad depicting a sense of urgency and suspense (Eclipsed168, 2012). Table 1 details a number of notable car ads in which classical music was used.

Table 1. Notable Car Ads Fitted with Classical Music.

Cars	**Music – Composer**
Kia K900	*Nessun Dorma* from Turandot - Puccini (Chun, 2020)
Jaguar E-PACE SUV	*La Folia* from Sonata no.12 in D minor - Vivaldi (JaguarNederland, 2018)
Nissan Juke	*Ride of the Valkyries* from the opera *Die Walküre* - Wagner (Eclipsed168, 2012)
Hyundai Sonata 2011 model	*Alla Turka* from Piano Sonata no.11 - Mozart (Musicco, 2010)
Audi R8	*Jeux d'eau* - Ravel (Buckley, 2008)
Lexus NX	*Andante* from Piano Concerto no. 21 - Mozart (Tormes, 2014)
Jeep Cherokee 2019	*Spiegel im Spiegel* - Arco Pärt (Jeep, 2018)
Toyota MR2	*Canzone Per Loretta/Gioventu Mia, Tu Non Sei Morta* from *La bohème* - Puccini (CarAutoPortal, 2009)
Aurora	*Simple Gifts* from Appalachian Spring - Copland (Takutaq, 2008)
BMW	2nd movement from Symphony no. 9 - Beethoven (J4MB0, 2007)
Volvo XC90	*Queen of the Night Aria* from The Magic Flute - Mozart (CACTUS48, 2019)

Arguably, one of the most commonly used genres in ads is popular music. Popular music is described as music that has wide exposure and is 'well-liked' by 'ordinary people', albeit typically for a limited period of time (Shuker, 1994). Studies in the use of popular music on ads have suggested that lyrics can have a positive effect on attention and memory (Olsen, 1995; Roehm, 2001). With its potential to deliver a message, the integration of popular music with ads can give symbolic meanings to products (see Allan, 2006; Kellaris et al., 1993; Zhu & Myers-Levy, 2005). The effects of popular music with lyrics have clear implications, especially when it is linked to a brand. Nevertheless, the use of popular music may be a double-edged sword, given that the lyrics that are understood in one culture may not

necessarily transcend to another; and the 'wear-out' effect of overexposure can cause a decline and dislike towards the ad (Craton & Lantos, 2011; Tan et al., 2006; Yeoh, 2021).

Pop music is often used in car ads. The lyrics in a song may at times, convey a story; hence delivering the objectives of the ad. Perhaps one of the most creative ways in which a popular song has been used in a car ad was by Škoda in 2007, when 'My Favourite Things', the tune from the Sound of Music, was used to advertise a team of professional bakers assembling sweet treats on a cake that resembled a life-sized car (Misclips, 2007). In a somewhat unusual and amusing Mercedes-Benz car ad, advertisers made use of Diana Ross's 'Upside Down' song to represent stability; albeit with the use of chickens (Mercedes-Benz, 2013). Rock songs from the 80s are also making a comeback in car ads, presumably targeting an older, more affluent generation of retirees. A prime example of this is Led Zepplin's 1971 'Rock n Roll' which was used in a Cadillac commercial (BroganCadTotowaNJ, 2010). The lyrics to Nick Drake's "Pink Moon" was paired with Volkswagen's 1999 Cabrio commercial (Pafenbach, 2013) to convey a sense of freedom driving around admiring stars on a quiet starry night. The visuals depicting a gentle mix of romance and contemplative reverie fitted well with the song's pacing (see also Lamar, 2010). In the latest Mini ad campaign, William Pharrell's catchy and playful song, Come Get It Bae was used to convey the energy and joy of the Mini Hatch Resolute Edition (Mini, 2022). The table below provides more examples of notable car ads that had no voice-overs but incorporated pop music.

Table 2. Notable Car Ads Fitted with Pop Music.

Cars	**Music - Composer**
Škoda Fabia	*My Favourite Things* from the Sound of Music (Misclips, 2007)
Mercedes-Benz Intelligent Drive	*Upside Down* - Diana Ross (Mercedes-Benz, 2013)
MINI Hatch Resolute Edition	*Come Get It Bae* - William Pharrell (Mini, 2022)
Volkswagen 1999 Cabrio	*Pink Moon* - Nick Drake (Pafenbach, 2013)
Cadillac Breakthrough	*Rock n' Roll* - Led Zeppelin (BroganCadTotowaNJ,

	2010)
Renault Captur	*Midnight City* - M83 (Dujardin, 2014)
Volkswagen T-Roc	*Are You Gonna Go My Way* - Lenny Kravitz (Belgium, 2017)
Jaguar S	*Desert Rose* - Sting (Boyd, 2008)
Honda 2016 Civic	*Walking On A Dream* - Empire of the Sun (Hinton, 2016)
Beetle 2012	*The Clapping Song (Clap Pat Clap Slap)* - Shirley Ellis (Openwheel6, 2011)
Chevy EV 2022	*Everywhere* - Fleetwood Mac (Chevrolet, 2022)
Chrysler 2004	*I Drove All Night* - Celine Dion (Takutaq, 2008)
Fiat	*Save Me* - Queen (Sebinnuendo, 2012)
Beetle 2012	*I'm A Believer* - The Monkees (Citygate Automative, 2012)

These days sound design is getting considerable attention in terms of its role in brand experiences, and represents a paradigm shift in how marketers seek to engineer sensory experiences for consumers based on various strategies (Hultén, 2015; Longley, 2019). Successful sound marketing can, for example, be seen in Unilever's Magnum ice cream advertisements, whereby the cracking sounds made by a model biting into the chocolate coating of the ice-cream are emphasized. Potato chip manufacturers have also long used noisy packaging for their products so as to emphasize the crunchiness of the chips inside (Byron, 2012; Spence, 2015; Stuckey, 2012). Sound effects in advertising can lead to an increase mental imagery of the product resulting in a more favourable perception of the advertised product (e.g., Miller & Marks, 1992; Yeoh & Allan, 2020).

The use of engine sounds have been instrumental in creating ads for motor vehicles. An excellent example of this is the Harley-Davidson motorcycle ad. An ad by Harley-Davidson depicting a symphony of bikes roaring down a mountain road to generate a free-spirited emotion is a testament to its marketing shrewdness (Sapherstein, 1998). The sounds of engine roar have been used mostly in sport car ads as can be seen in Table 3. However with newer technological advances in car manufacturing specifically hybrid and electric cars,

companies are forced to create ‘textured whooshes, filtered sweeps and techno noises’ (SNK Studios, 2018, see also Alexander, 2021; Kia America, 2022; Münder & Carbon, 2022).

Table 3. Notable Car Ads with Designed Product Sound.

Cars
Honda Accord (WebRidesTV, 2009)
Ferrari 296 GTB (Commercials, 2022)
Bugatti Chiron (Bugatti, 2017)
Aston Martin (Commercials, 2018)
Audi R8 (Commercials, 2016)
Audi R8 V10 Plus (Carleasingmadesimple, 2013)
BMW M4 GTS (Commercials, 2016)
BMW M4 Coup (BMW, 2014)
Jaguar I-PACE (Jaguar, 2018)
Viper (Parts, 2017)
Porsche Cayman S 981 (CARJAM, 2013)
Audi C7 RS6 (CARJAM, 2013)
Mercedes AMG GT R (Mercedes-Benz, 2016)
Porsche 911 GT3 RS (Porsche, 2022)
McLaren 720s Coupe (McLaren, 2017)

Rationale for the present study

According to Anurit et al. (2002), customers purchase cars for one of two reasons: for the ‘routine and functional' or for the ‘experiential and symbolic’ benefits. Despite a wealth of car ads on the internet (e.g., YouTube) and an enormous amount of money spent, there is seemingly limited publicly-available empirical data on the effectiveness of these marketing strategies. Research on luxury cars have mainly focused on factors that influence consumers’ decisions in purchasing luxury cars (Boonyanuson, 2018; Karunanayake, 2020; Shrivastava, 2022; Tabavar, 2015); making comparisons between luxury car makers (Sari & Kusuma, 2014); and comparing culturally different market segments on their perception and behaviour in purchasing a luxury car (Anurit et al., 2002; Nayeem, 2012). This study investigates the

extent and limitation that musical fit and/or sound effects may have on consumers' perception and evaluation of a luxury sports car shown in a short ad.

Ferrari's cars are associated with wealth and symbolize exclusivity, power, speed, elegance, and excitement (Ferrari, 2023). As mentioned above, music that fits the attributes of the product should therefore prime relevant beliefs about the product, while the use of sound effects can emphasize characteristics of the advertised product. Research conducted by Yeoh and Allan (2020) amongst university students investigated the integration of sound effects in advertising fried chicken. They found that the sound of marinating (e.g., fingers rubbing sauce onto the chicken), frying, and biting into the crunchy fried chicken resulted in positive perceptions of the food product when compared to watching the video with either pop music or no music. Most published research on sound design have demonstrated positive results on food and drinks (e.g., Knöferle, 2012; Piqueras-Fiszman & Spence, 2015; Spence, 2012, 2015; Spence & Wang, 2015; Velasco et al., 2013), and utilitarian products (Spence & Zampini, 2007). However, soundscapes and sound effects are all around us, and the purpose of the present study is to understand whether such sounds can also be harnessed to influence perception and purchasing behaviour for luxury items (cf. Velasco & Spence, 2019).

The use of sound design in cars have long been experimented on by carmakers in order to create an emotional connection with the consumer. Sound engineers go to great lengths to acquire the right 'sounds' with which to convey the overall feel of the car. For example, the luxury car brand Bentley hired a sound design company to create sounds for indicators, alert systems and requested that every interior sound to be custom-made. To understand the importance of custom-made sounds, the designer had to record thirty different clock chimes and tweaked these sounds for the car indicator's click-clock (Leprince-Ringuet, 2018). Similarly, as early as 2010, BMW developed an Active Sound Design under its Research and Innovation Center to creatively design engine sounds in the passenger

compartment, thus making the dynamics of driving even more tangible (El-Sherif, 2010). Most sports and luxury car models (e.g., Lamborghini and Maserati) incorporate engine sounds that are augmented and/or reconstructed in order to amplify the appropriate frequencies and increase the perceived stiffness of the engine support (Alexander, 2021). Porsche, for example created a 'lion's roar' in its air cooling compartment for its combustion engines; and when Porsche switched to a water-cooling system, sports car enthusiasts grumbled about the missing 'lion roar' (Hsu, 2019). Such real-life engineering of car engine sounds have been associated with power, speed, and sportiness, relating also directly to a particular car brand (see also Harwell, 2015; Olenski, 2014). With huge investments and research in creating a 'signature sound', it would be of interest to identify the breadth and scope of such sounds in car ads.

Methods

Participants

One hundred and sixty participants volunteered to take part in this study with an equal number of males and females. The mean age of participants was 24.4 years (SD = 6.3). They were divided into four groups of 40 participants each, with 20 females and 20 males per group. The first group watched the Ferrari car ad matched with classical music; the second group watched the ad while listening to pop music; the third group watched the ad while listening to engine sound effects; and the fourth group watched the ad with no sound at all. The participants were students and were approached individually at the library of a local university. They were fluent in both written and spoken English.

Pilot study

The pilot study had 20 participants drawn from the same general population as the sample used in the main experiment. A specific Ferrari ad taken from the official Ferrari YouTube channel (2019) was chosen based on it having no voice-overs and layover of words that might influence participants' perception of the car. Participants watched the Ferrari ad without any music to ensure that its length (1 minute and 6 seconds) was appropriate and sufficiently interesting. Next, they were played samples of fast pieces from a YouTube playlist of Western classical music, and a selection of pop music that contained the lyrics 'Ferrari'. All of the participants agreed that the 3rd movement from Vivaldi's Violin Concerto in G minor (classical music) was of high tempo and fitted the Ferrari ad, highlighting the speed and excitement associated with driving the car. Participants were unanimous in identifying that the lyrics to the chorus of Bebe Rexha's Ferrari song (Rexha, 2018) fitted the elegance, speed, and exclusivity of the car. Finally, the volume for all music conditions was mixed to ensure consistency across ads.

Materials and Design

The participants were presented with either a Ferrari ad paired with classical music, pop music, engine sound effects, or no sound. The Western classical and pop music were downloaded from the YouTube channels Kennedy (2014) and Rexha (2018), respectively. The pop music condition used lyrics that fitted with the ad, for example the lyrics '…I'm a Ferrari…I keep on going…living in the fast lane…'. Both pieces of music were then edited on iMovie to ensure that the musical beats fitted with the changing visuals in the ad. The ad with engine sound effects was taken from the official Ferrari YouTube channel (2019). All of the sounds were muted in the 'no music' (i.e., silent) condition. The music was played at a comfortable background level via external Bluetooth loudspeakers linked to the laptop playing the ads.

Procedure

The study was carried out between 9:00am-5:00pm over ten weeks. Participants were recruited by approaching people individually to volunteer, for which they were asked to complete a 2-page questionnaire. All of the participants were tested individually in a quiet room at a local university library. This was a single-blind research whereby participants were told that Ferrari was doing a survey to better understand perceptions of their car on a younger demographic. The participants were invited to watch a Ferrari ad and thereafter given sufficient time in which to complete the nine-item questionnaire. Question 1 asked participants to give a rating between 1-5 concerning how frequently they drove, with 1 being 'every day' to 5 being 'never'. The next six questions required the participants to rate their perception of the Ferrari car in terms of its power, speed, engine technology, driving excitement, elegance, and exclusiveness on 5-point Likert scales. Note that the words used to determine the car's characteristics were taken from Ferrari's official website. Question 8 required the participants to state an appropriate price range for the car that was advertised, with 1 being 'MYR100,000 - MYR299,999' (USD23,000 – USD67,000) to 5 being 'MYR2.1 million – MYR3 million' (USD500,000 – USD668,000). The final question asked the participants to rate the extent to which the background music/sound effects playing in the ad influenced their answers, with 1 being 'not at all influenced' to 5 being 'very influenced'. This question was obviously not asked of those participants for whom no music/sound effects was playing. Demographic data was collected at the end of the questionnaire.

Results and Discussion

The questionnaire for the 7 items (excluding the frequency of driving) gave rise to Cronbach's alpha of 0.90. A one-way ANOVA was conducted in order to determine whether

the participants' perception of the car (power, speed, engine technology, driving excitement, elegance, exclusivity, and price) was influenced by music/sound effects. The results indicated a significant main effect ($F(3, 156) = 38.91$, $p < .001$, $\eta^2 = 0.43$). In particular, participants who heard sound effects rated their overall perception at 30.18 ($SD = 3.27$). Meanwhile, participants who listened to classical music playing rated their overall perception with a mean of 27.73 ($SD = 4.19$), and those who listened to pop music gave a mean rating of 27.60 ($SD = 3.72$). Participants who heard no sound rated their overall perception of the car at 19.45 ($SD = 6.92$). A Tukey post hoc test revealed perceptions of the Ferrari was statistically different ($p < .001$) when no music was playing as compared to when sound effects, classical, and pop music were played.

To further breakdown the results, a one-way ANOVA was conducted to determine the exact characteristics of the Ferrari car that influenced participants' perception. When no music was playing, compared to when classical, pop, and sound effects were played, the results were statistically significant, with $p < .001$ for all categories of perception. This meant that the Ferrari was given the lowest rating for all characteristics of the Ferrari car when no music/sound effects were played in the ad.

When it came to perceived power, driving excitement, and engine technology, the results revealed that there were statistically significant differences between those participants who heard classical and pop music with those who heard the relevant sound effects ($p < .005$). Specifically, participants rated the Ferrari as most powerful when sound effects accompanied the ad ($M = 4.43$), followed by those exposed to either pop or classical music ($M = 3.88$ and 3.73, respectively). Meanwhile, participants who watched the ad in silence gave the lowest rating to Ferrari's engine power ($M = 2.70$). Participants rated the Ferrari as most exciting when sound effects were played ($M = 4.65$), followed by those who were exposed to either pop or classical music ($M = 4.05$ and 4.03, respectively). Participants in the

no music condition rated the Ferrari as least exciting (M = 2.50). Likewise, participants rated Ferrari's engine technology highest when sound effects were played (M = 4.30), followed by participants who heard pop and classical music (M = 3.83 and 3.63, respectively). Participants who had no music playing gave the lowest ratings to Ferrari's engine technology (M = 2.90).

The use of classical music was especially effective when participants were asked how highly they rated Ferrari's elegance and the price they thought was appropriate for the car that had been advertised. There was a statistically significant difference between classical and pop music ($p < .005$). Specifically, participants rated the car as being most elegant when the matched piece of classical music was played (M = 4.63), followed by sound effects (M = 4.25), and pop music (M = 3.90); with the car being rated as least elegant when no music was played (M = 2.70). Similarly, participants priced the car highest when classical music was played (M = 4.63), followed by sound effects (M = 4.30), and pop music (M = 3.80); with the lowest car prices once again being recorded in the no music condition (M = 2.78).

(Place Table 4 approximately here)

When participants were asked to rate the car's potential speed and exclusiveness, there was no significant difference between all conditions with the exception of the no music condition. When participants were asked if their answers were influenced by the background music/sound effects, the results indicated a significant effect ($F(2, 117) = 5.62$, $p < .05$, $\eta^2 = 0.09$). Participants who listened to sound effects playing rated highest the influence of music on their decisions at 4.3 ($SD = 0.61$), while those who listened to classical music and pop music gave mean ratings at 4.25 ($SD = 0.84$) and 3.7 ($SD = 1.14$), respectively. A Pearson correlation coefficient test was conducted to measure the strength of the relationship between

the influence of music/sound effect and participants' perception of the car's characteristics. This revealed a weak positive correlation ($r = 0.271$, $p = 0.003$), showing that those who reported a greater impact of the auditory track over their judgments did indeed give higher ratings on average.

Conclusions

The study reported here illustrates the important role played by sound design in the luxury car category. While Yeoh and Allan (2020) previously demonstrated that relevant sound effects resulted in positive perceptions of fried chicken (a utilitarian product), the results of the present study affirms that sound effects can also result in positive perceptions of hedonic, luxury products.

However, more specifically, the results of the present study demonstrate that the use of engineered sound effects can create a positive impression concerning luxury sports cars. More than any other type of music, the engineered sounds of a roaring engine influenced people's perception of the power, excitement and engine technology associated with the vehicle. The sight of a car's reverberating engine and an accelerating speedometer on the car's dashboard were emphasized by the thundering sounds of the engine starting and the rumbling of acceleration (cf. Youssef & Spence, 2023). Despite not having a voice-over, or layover of words on the ad, consumers perceived the car's characteristics positively. These results highlight how product sounds can be used to enhance specific product attributes/qualities (Ho & Spence, 2013; Spence & Zampini, 2006, 2007). Interestingly, when the participants were asked to rate the advertised car's elegance and to state an appropriate price range, classical music was most effective in commanding the highest price range while describing the car as most elegant compared to all other music/no music conditions. Consistent with prior research, classical music has often been stereotyped as connoting

wealth, affluence, and luxury (e.g., Areni & Kim, 1993; North et al., 2003; Yeoh & North, 2013; see Spence et al., 2019, for a review). Future research may investigate whether it is possible to adapt both classical music and sound effects in order to create a perfect fit for a luxury sports car ad.

Despite a slightly weaker rating when the ad was viewed alongside pop music compared to classical music and sound effects, the result nevertheless points to an interesting fact. Questions here were geared specifically to the characteristic of the car in question, and the lyrics did not contain words directly related to power, speed, engine technology, excitement, elegance, or exclusiveness. Hence, although the selected song fitted the car ad (since it had the word Ferrari in its lyrics), the effect was not strong enough to influence participants' perception of the car's characteristics as compared to when classical music and sound effects were used.

Perhaps one of the most striking results to emerge from the present study is that participants who watched the ad with music/sound effects agreed that their responses had been influenced by the music and sound effect that was played in the ad. A subsequent correlation analysis revealed a significant, albeit weak, positive correlation, meaning that those who rated highly that music/sound effect influenced their answers, rated also more positively their perceptions of the car. One possible explanation for this is that over the last quarter of a century, consumers may simply have become more aware of the potential influence of music over their perceptions and behaviours. When comparing to previous literature (North et al., 1997, 1999; Yeoh & North, 2011), the majority of participants in previous research seemed either unaware or unwilling to concede the effects of music on their actual product choices. In prior research, only nominal data was collected and hence it was difficult to factor frequency into statistical analyses; while participants in the present study were required to rank their responses. Future research may consider looking at the musical

elements and sound design in more detail, and its potential effects on perception, although such an approach would have implications for external validity.

The research reported here is subject to limitations that highlight several potential issues arising from the use of musical fit and sound design. First, these studies were conducted under strict and highly-controlled laboratory conditions and on an individual basis. The participants in this study were students, and hence they may possibly not have been as 'invested' as potential buyers of Ferrari cars. The results might change if the study were to be repeated while testing on a different, more realistic demographic of potential purchasers of Ferrari cars. That said, targeting such an exclusive demographic would likely raise its own challenges in terms of the sourcing of a sufficient pool of willing participants.

Second, it seems unlikely that many, if any, of the participants in the present study would have had prior experience driving a Ferrari. Hence, it would be reasonable to argue that the use of music and/or sound effects may have had rather less influence over the perception of the vehicle if consumers have had previous exposure of driving one. For example, Yeoh and North (2012) found that consumers who had prior experience with a particular brand were not influenced by music that fitted the brand attributes. To the extent that such a result is generalizable, this suggests that musical fit can influence perception only when consumers do not already have a clear preference for the product (see Goldstein & Gigerenzer (2002) on the theory of recognition heuristics). Similarly, the Elaboration Likelihood Model (ELM) which was first introduced by Petty, Cacioppo, and Schumann (1983) argued that the processing of relevant information occurs via two routes: the central route and the peripheral route. In the central route, when consumers are in a state of high involvement, meticulous consideration of information relevant to a product is evaluated thoughtfully. Meanwhile in the peripheral route, consumers who do not have the motivation, opportunity or ability to scrutinize relevant messages of the product will rely on cues (e.g.,

background music) associated with the product (Petty, et al., 1981; Gorn 1982). Since participants in this study were not prior users nor potential customers of the advertised car, it remains to be studied if similar results would be obtained from these group of consumers.

Third, the use of multisensory marketing in cars are on the rise (Olenski, 2014; Harwell, 2015; Weidmann, et al., 2018), and the results of this study have demonstrated, at least for now, that sound and sight are crucial elements in influencing (or not) consumers' perceptions of a luxury car. Future research may consider this: would results be similar if this was conducted on a budget (utilitarian) car? As with previous literature on utilitarian products, (see Yeoh, 2010; Flynn, et al., 2022), musical styles had no bearing on perception and price as these items were not considered as social identity products. Next, would the use of other sensory elements or a combination of elements such as, for example, smell and touch lead to a more persuasive result in the case of a luxury car? Finally, with the increase in production of electric cars, how can car advertisers convey the message effectively via music and sound effects?

In conclusion, this current study provides empirical data that musical fit and sound design have the potential to influence consumers' perceptions of a luxury car. However, further research is undoubtedly necessary before advertisers and practitioners can fully use the effect of musical fit and sound design in real commercial settings.

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