

Master Thesis 2023

Grammatical gender in the context of fragrance marketing

Radboud University Nijmegen, Netherlands

Study degree: Communication and Information studies

Supervisor: Laura Speed

Student: Ida Nowak

Date of submission: 22/08/2023

1. Abstract

This study investigates the influence of grammatical gender on consumer behaviour among Polish native speakers, focusing on its impact on advertising. The aim is to understand how grammatical gender, a prominent linguistic feature in the Polish language, shapes consumer perceptions, attitudes, and preferences toward products. A questionnaire-based survey was conducted with 83 Polish native speakers, who evaluated hypothetical advertising scenarios that manipulated the grammatical gender associations of fragrance scent notes. Participants rated their perceptions of the fragrances, purchase intentions, and short-term memory of the fragrances depicted in advertisements.

The findings indicate that there was no direct effect of grammatical gender congruency on purchase intention, product liking, or short-term memory. While previous research suggested a potential influence of grammatical gender on product perception and subliminal categorization, this study did not find significant evidence supporting such a relationship.

These findings contribute to understanding the role of grammatical gender in advertising and consumer behaviour. Although a direct relationship between grammatical gender congruency and purchase intention/product liking/memory was not found, the influence of grammatical gender cannot be disregarded. Further research is advised to better understand the effects of grammatical gender in advertising across diverse consumer contexts.

Keywords: grammatical gender, purchase intentions, product liking, memory, Polish language

2. Background

There is a considerable number of published research on language and thought correlation (e.g., Gentner & Goldin-Meadow, 2003; Weist et al., 1997; Casasanto, 2011). This idea was researched and called *linguistic relativity*, also known as the Sapir-Whorf hypothesis. According to Wolff and Holmes (2010), this theory is related to a more rigid theory called language determinism, where language is thought to determine the thought processes of its speakers while linguistic relativity proposes language only influences thought. The linguistic relativity hypothesis is based on three claims; meanings and syntactic constructions of words differ across languages, language semantics influence how speakers perceive and conceptualize the world, and speakers of different languages think differently (Wolff & Holmes, 2010). In the last two decades, researchers worked on finding evidence for the Whorfian hypothesis, since it was considered controversial and raised some criticism when it first emerged (Lucy, 1997). Nonetheless, recent studies have found evidence of the theory leading to more interest in this field (Wolff & Holmes, 2010).

Linguistic relativity has been demonstrated to relate to a wide range of domains, namely, motion, colour, spatial relations, numbers, false belief understanding, and grammatical gender (Wolff & Holmes, 2010). For example, Davies and Corbett (1997) found differences between English, Russian, and Setswana languages in a colour categorizing task. The three languages used in the study have a different number of colour terms and as a result, perceive colours differently. Using 65 colours as a representative set, participants divided the colours into groups that looked similar. In contrast to English or Russian speakers, Setswana speakers grouped blue colours with green colours more often because they have one term for both colours. This suggests that linguistic relativity can shape the way we perceive and categorize abstract concepts, such as colour. Linguistic relativity can also affect abstract concepts like 'time'. Boroditsky (2001) researched the difference between English and Mandarin speakers regarding conceptualizing time. English speakers are thought to view time as horizontal, while Mandarin speakers often depict it as vertical. What is interesting is that Mandarin speakers not only tend to think vertically when they think about time in Mandarin, but also when they speak in English. Mandarin speakers were faster to confirm that March comes earlier than April if they just had seen a vertical array of objects than if they just had seen a horizontal array, and the reverse was true for English speakers. This highlights the impact of language on shaping cognitive processes beyond one's native tongue. All these different studies point towards this relationship between language and perception, leaving an open research question on the extent of this relationship and its practical implications as the

majority of studies do not examine real-world results, such as real-life human behaviour, but only speculate on its effects.

3. Introduction

Linguistic relativity can manifest itself as a result of grammatical gender. There are three types of languages according to Prewitt-Freilino et al. (2012): genderless languages (e.g., Finnish), natural gender languages (e.g., English), and grammatical gender languages (e.g., Polish). In genderless languages, nouns lack any grammatical gender distinction while natural gender languages indicate gender by pronouns (for example, he or she), but most nouns lack gender distinction. Nouns in grammatically gendered languages have a distinctive gender assigned to them, which influences grammatical agreement on other parts of speech in declensions and conjugations (Maciuszek et. al., 2019). For example, in Polish the noun for a bridge (most) is masculine and in German (brücke) is feminine.

In line with the linguistic relativity theory, Boroditsky (2003) claims this linguistic attribute affects cognitive processes like memory, categorization, personalization, and sorting. For example, grammatical gender can lead people to attribute male and female attributes to inanimate objects without biological genders (Wolff & Holmes, 2010). Imai et al. (2014) compared German and Japanese speakers and observed a pattern where German speakers gave animals with a specific grammatical gender human names with congruent gender. These results however were limited only to animals and not inanimate objects. What is more, bilinguals of two grammatically gendered languages may not present similar patterns. In Bassetti, (2007) Italian-German children did not view the gender of nouns in the same way as Italian monolinguals due to exposure to a German grammatical gender that differs from the Italian grammatical gender. Researchers investigated the effects of grammatical gender on object concepts in bilingual speakers of two languages that assign opposite genders to the same object. When assigning feminine/masculine voices to objects, Italian-German bilingual children were unaffected by Italian grammatical gender. Meanwhile Italian monolingual children preferred to attribute voices consistent with Italian grammatical gender of the nouns used in the study. Moreover, this type of linguistic categorization may not only influence native speakers. According to a study by Kurinski and Sera (2011), native speakers of English (a naturally gendered language) were influenced by learning Spanish (a grammatically gendered language) and therefore attributed gender to inanimate objects according to Spanish grammatical gender. Considering that the study was done on speakers who acquired the ability to speak Spanish as adults it can only suggest that the perception of nouns can be influenced by the acquisition of grammatical gender alongside learning a new language. It challenges the notion that language and thought are fixed, as seen in bilingual individuals who can learn and navigate multiple languages. Accordingly, this study emphasized the ability of

humans to adapt to alternative linguistic circumstances and suggests that language and thought are intricately intertwined but also capable of change. It suggests a deeper understanding of how language influences our cognitive abilities.

Until recently, there was strong evidence that only languages with two existing grammatical genders (female, male) show significant differences in categorization tasks, contrary to languages with three grammatical genders (female, male, and neutral) where the effect was not found (Sera et al., 2002; Vigliocco et al., 2005; Clarke et al., 1981). Vigliocco et al., (2005) claimed that gender categorization does not have an effect when mapping between the gender of nouns and the sex of human referents is not so transparent, which essentially has been generalized to all languages with more than two grammatical genders. However, later studies considered the Polish language which also consists of three grammatical genders like German, but this time found significant effects (Maciuszek et al., 2019; Haertlé, et al, 2017) conducted a voice-assigning experiment similar to Bassetti, (2007) described earlier. Haertlé et al. (2017) found that both Polish and French speakers tend to attribute masculine and feminine features to objects in alignment with the grammatical gender of the noun. Despite the difference in the number of genders in both languages (two in French, three in Polish), participants from both language groups more frequently chose adjectives with associations of masculinity or femininity that were congruent with the grammatical gender. Kurz et al. (2022) took into consideration the differences in grammatical gender in German and Polish. In German the grammatical gender of a noun is marked by a corresponding article (e.g. *der* apfel) meanwhile in Polish there are multiple gender indicators, such as pronouns, adjectives, and verbs that let speakers know what the gender of a noun is. Conjugation in Polish is simply more extensive compared to German. For instance, Polish masculine nouns typically end in a consonant, whereas feminine nouns end in -a with certain exemptions (e.g., male name ending with -a; Kuba – short for Jakub).

Due to this noun transparency, Polish speakers have grammatical cues regarding words' gender, and it might make it easier to categorize nouns, Kurz et. al. hypothesized. Their study also confirmed that the majority of Polish participants had associated the objects with their assigned grammatical gender and did it more often compared to German participants. This result suggests that not only is the number of grammatical genders important but the nature and extent of it that makes a difference in the association. Polish speakers can tell the gender of a noun without understanding the meaning of the noun. In the case of Polish, it is the transparency in word endings that give cues and therefore helps with the association. That may explain the results of Maciuszek et. al. (2019) where nouns written down were easily

grouped in regard to grammatical gender implicitly compared to pictures of objects. It can be expected that for inanimate objects in Polish, the word needs to be written down to activate the grammatical gender cue. This transparency is a shared trait of all Slavic languages and does not apply to Germanic languages.

As previously mentioned, the majority of studies do not focus on grammatical genders' practical implications such as real-life human behaviour, and only speculate on its effects. For example, it is still unknown what influence can grammatical gender have on advertising. Previously, Schmitt and Zhang (1998) considered the effect of congruent classifiers in advertising. Classifiers are used in some languages as a reference point for a noun categorization that cannot be omitted. Walter Bisang wrote "The function of classifiers is to make count nouns enumerable by individualizing and classifying them." (Bisang, 1999, p. 113). Classifiers are extra words added after the number in a specific group, for example in the Korean language a person is classified by the word 'myeng' and animals by 'mali', therefore two (du in Korean) people would be "du myeng" while two animals "du mali" (Unterbeck, 1994). Researchers have compared the effect of classifier congruence between Japanese and Chinese speakers that use different classifiers and English speakers who do not use classifiers (Zhang & Schmitt, 1998). Participants were shown campaign photos with either congruent or incongruent classifiers. The ads with classifier that indicated "graspability" was shown to half the participants with an image of something being grabbed by a hand, while the other half saw the same object without a hand holding it. Participants preferred ads with a classifier that was relevant to the advertisement (in this case, a hand holding an object). Researchers claimed that advertisers could perhaps greatly benefit from identifying language characteristics associated with their products and creating advertisements that appeal to those characteristics.

Previously described studies suggest that language characteristics influence perceptions and preferences. Similar cognitive processes apply to other aspects of human behaviour. People tend to seek out congruency in their lives, they want to fit in and follow the norms that are set for them (Cialdini, 1993). Consequently, when they are reminded of what is socially approved or disapproved, they are more likely to align their behaviour with the desired social standard. In marketing, gender is a crucial factor, consciously or unconsciously, because both men and women want to feel that the potential product is "theirs" (Milner & Fodness, 1996). Gendered products are sex-typed products that can be effectively marketed targeting a specific gender but could also be broadened to both genders (Fugate & Phillips, 2010). Milner and Fodness (1996) examined the link between products and gender in the minds of Chinese

consumers. They suggested that products do have a specific gender, created by human perceptions and stereotypes. They found out that in fact there is a use of gender-specific cues in advertisements, such as the roles of buyer, user, and promoter, which can influence product gender identification and therefore subliminally target the desired gender. Grohmann (2009) claimed that marketers support the need for self-expression by creating masculine or feminine brand associations further implying that customers attribute human personality characteristics to brands. Conversely, according to Schertzer et al.,'s (2008) metanalysis, gender is a commonly used segmentation variable in marketing, but its meaning is not always clear since it can refer to biological differences (male and female) or cultural roles (masculine and feminine). They noticed that not only biological gender but also cultural norms play an important picture in customer segmentation. Marketers are using the knowledge to create an "image" of a brand or a product to target a specific customer group (Debevec and Iyer, 1986). Fugate and Phillips (2010) did a more recent study that showed people more strongly identify products as gendered rather than undifferentiated (or asexual) in recent years. They tested gender categorizations of products by letting participants rate the femininity and masculinity of a product. However, they claim that gender-congruent products may not be as important to some individuals as it is to others, as some individuals may not prioritize seeking congruency in their products.

Multiple factors can subliminally affect gender categorization among customers. For example, gender congruence can be positively affected by virtual sales assistants (VSAs): having a VSA gender and product gender congruent positively affects trust in sales assistants and the credibility of advice on the item (Beldad et al., 2016). An ambient scent congruent with gender-based products causes shoppers to evaluate the store and its merchandise more positively and exhibit approach behaviours (e.g., spending money) in comparison to an incongruent scent (Spangenberg et al., 2006). In their study, Spangenberg et al., (2006) established through a pre-test that rose maroc was thought to be a masculine scent and vanilla was selected as the feminine. These two floral scents were distributed in a store to observe a difference in the shopping behaviour of customers. When customers were exposed to gender-congruent ambient scents spent more time in the store, had stronger intentions to visit the store in the future, purchased more items, and spent more money on their purchases. However, it should be noted that different groups of people may have more specific preferences than others. For example, masculine people may prefer masculine brands and have negative responses to feminine brands, meanwhile, feminine people despite preferring feminine brands are accepting of masculine brands (Worth et al., 1992). Moreover, there

might be a difference between masculine women and feminine men because according to Worth et al. (1992), they do not seek out congruency in the same way that masculine men and feminine women do. Masculine women are leaning more toward traditionally manly preferences the opposite of feminine men who may have a preference for a feminine product. Due to their openness to using products targeted to the opposite gender, they can be more fluid and are more unpredictable with their choices.

Grammatical gender may have an important impact on the marketing of fragrances in particular as perfumes are often marketed to a specific gender. There has been evidence that grammatical gender is related to odor cognition in previous studies. In Speed, and Maijd's (2016) study participants took part in an odor recognition task. To test whether fragrance gender congruence would affect how fragrances were perceived and remembered, they manipulated the grammatical gender of fragrance descriptions. The task first involved reading descriptions of fragrances that contain ingredients with a feminine or masculine grammatical gender, followed by smelling the fragrances and then completing an odor recognition test. When fragrance descriptions match the fragrance's gender, fragrances were remembered more effectively. They claimed that their results are important for product marketing because using a language for recall can be a powerful tool. It is thought that a consumer is more likely to purchase a brand or product they can recall, which indicates they have registered it in their memory (Nedungadi, 1990; Crafton et. al, 1981). In line with Speed and Maijd's study, Schweppe et al. (2009) found that grammatical gender information influences the recall of short text passages on lexical substitution errors. There was a gender congruency effect when the target word appeared both in the most recent sentence and the previous sentence, which means that the target word induced more intrusions than the gender incongruent one. However, authors based on their study and previous ones claimed that This could mean that having a grammatical gender congruency in the product description may help with the memory of the product itself or its components.

To conclude, this study will focus on exploring the extent to which grammatical gender can influence the perception of a product and whether people subliminally prefer a certain product presented in an advertisement due to grammatical gender congruency. Knowing that grammatical gender can make people attribute masculine or feminine characteristics to inanimate objects (Wolff & Holmes, 2010) this study will explore such connection with scents. Up until recently it was considered impossible to find an effect of gender categorization in languages with three genders (Sera et al., 2002; Vigliocco et al.,

2005; Clarke et al., 1981), however, later studies proved otherwise by including the Polish language (Maciuszek et al., 2019; Haertlé, et al, 2017). This could be due to the fact that the Polish language has complex grammatical gender structures and gender transparency cues, Polish people are expected to like products with congruent grammatical gender to their scent notes after seeing them written down. To measure the real-life response this research looked into the purchase intentions, attitudes towards the product, and short-term memory of it from looking at advertisements that manipulate grammatical gender. This was based on a claim made by Schmitt and Zhang (1998) that language influences the perception of ads. To further investigate the impact of grammatical gender on purchase intention (Spangenberg et al., 2006), product liking (Milner & Fodness, 1996), and short-term memory (Speed & Majid, 2016), we explore these variables based on the claim that it can trigger these effects.

RQ: To what extent will the grammatical gender of fragrance notes affect the purchase intention, product liking and, short-term memory of a potential Polish customer based on gender congruency with customer gender?

Based on previous research indicating that scents congruent with a consumer's gender can stimulate purchase intentions (Spangenberg et al., 2006) and the influence of grammatical gender in the Polish language on gender associations (Maciuszek et al., 2019; Haertlé et al., 2017), is expected to observe individuals demonstrating a stronger inclination to purchase a product when the grammatical gender of its fragrance notes aligns with their gender. According to Morwitz et al. (2007), purchase intention is frequently used by marketing managers to predict possible sales. Measuring purchase intentions helps in deciding on the customer target group and in which geographic markets the product should be launched. Moreover, this scale is often used to pretest appropriate advertising (Bird & Ehrenberg, 1966). Therefore, this scale is expected to showcase higher purchase intentions when the grammatical gender of its fragrance notes aligns with the subjects' gender.

H1: Polish people exhibit higher purchase intentions after viewing advertisements with a grammatical gender of fragrance notes congruent to their own more than incongruent ones.

Knowing that people seek gender congruence in their life (Milner & Fodness, 1996), it is expected to observe subjects have a preference for a product when the grammatical gender of its fragrance notes aligns with their gender. This will be measured with attitude towards the product scale, the higher the mean the more positive the attitude towards the product. It is

expected to see a higher mean result when the grammatical gender of the fragrance notes aligns with the gender of a subject.

H2: Polish people will like a fragrance presented in advertisements with a grammatical gender of fragrance notes congruent to their own more than incongruent ones.

Finally, knowing that grammatical gender congruent with subjects' gender can influence short-term memory (Schweppe et al., 2009; Speed & Maijd, 2016) we can expect participants to remember a product by its ingredients when the grammatical gender of its fragrance notes aligns with their gender. In a study by Speed & Maijd, (2016) participants remembered the scent better when its grammatical gender was congruent with the subject's gender.

H3: Polish people will remember fragrance notes better with a grammatical gender of fragrance notes congruent to their own better than incongruent ones.

4. Methodology

Materials

This study will measure responses to unisex perfume advertisements with a description of the main scent notes. In Polish, the noun 'perfume' is 'perfumy,' which belongs to a noun group known as 'pluralia tantum'. These nouns lack a singular form and exist only in the plural. Perhaps because perfume consists of multiple liquids and therefore cannot be deemed as plural, similar to nouns like glasses or trousers in both Polish and English. Due to this distinction, Polish nouns within this particular group do not carry grammatical genders. Therefore, the word perfume itself does not have a gender in Polish giving it a neutral association. To ensure that only the grammatical gender of notes and the gender of participants influence the dependent variable measures, the product will be unisex. This choice was made to avoid any gender biases and make sure that any of the potential perfume could be for them. Black and white bottles (neutral colours) were chosen in order to make the product unisex.

The two independent variables in this study were: the gender of a subject and the grammatical gender of a scent note. The gender of a subject was established from answers to the question in the main survey "What is your gender?". The three available answers were "man," "woman," and "non-binary." The grammatical gender of a scent note was established by the authors based on grammatical rules of the Polish language. Nouns ending with consonants in Polish are masculine, those ending with "-a" are feminine, and those ending with "-o" or "-e" are neuter (Kurz et al., 2022). To sum up, independent variables were operationalized by analyzing survey data and Polish grammar rules.

To determine whether notes used in ads were considered unisex, a pre-test was conducted. When measuring the effect of grammatical gender, it is important not to influence a scent that is considered predominantly feminine or masculine. For example, sweet flowery scents can be considered feminine despite the masculine grammatical gender. To avoid this bias, unisex and therefore the scents that appear in perfume targeted to all genders were used. [Fragrantica.com](https://www.fragrantica.com) provides information on the most popular (according to website users) unisex perfume. Based on information from this website we created a list of notes [see Appendix A] from the 20 most popular unisex perfumes in English and asked pre-test participants to rate each fragrance note on the extent of femininity and masculinity the note has which will be based on the Speed & Majid's (2019) pre-test scales. The idea was to find perfume scents in

unisex perfume that are not associated with either men or women and can be truly appreciated by everyone. There were 20 native English speakers who participated. English is a naturally gendered language therefore native English speakers are not affected by associations from grammatical gender and are ideal for the control group. Additionally, it was important to include both men and women in the Pre-test to avoid gender bias in rating. Pre-test subjects were eleven men, eight women, and one non-binary person. Perfume notes were rated for their perceived level of gender association. First, five scents with the highest mean were removed. Next, the results showed that the average mean for feminine scents was $M = 1,63$ meanwhile the mean score for masculine-gendered scents was $M = 1,91$. The resulting list included an equal number of notes with both feminine and masculine grammatical gender in Polish.

This list was then used to develop product advertisements. They were grouped to ensure a similarly low mean since the higher mean the more gendered the scent was deemed [see Appendix B to see grouped scents and means]. Instead of trying to create interesting scents, it seemed more appropriate to create scents with similar combined mean results from the pretest. The grouping strategy was created to avoid the risk of an author's personal preferences influencing the final scent combinations and making them more appealing to women. For instance, the author may not have liked having orange and lemon together in one perfume as it may be too acidic for personal taste, conversely male participants could potentially appreciate a strong acidic scent. Consequently, scents were combined based on their average group mean. Next, to ensure accurate translation of notes from English to Polish, two Polish native speakers with advanced English skills applied the back-translation method. This process involved two separate sets of native speakers conducting translations and subsequently comparing them to arrive at a consensus (Brislin, 1976). Advertisements in the final survey contained three unisex notes with reference pictures and written names of scent notes with either masculine or feminine grammatical gender in Polish [See Appendix C for adverts]. Photos of ingredients were the same as in the pre-test as a part of consciously trying to avoid any gender biases. The images that showed the ingredients were simple yet professional to imitate a real advertisement to give an illusion that the product is real and can be purchased. Creating the real advertisement "feel" was important to not reveal that the hypothesis is focused on language relativity and make it seem like the importance is on rating the product.

Subjects

Based on the study by Kurz et al. (2022) on the complexity of the structure of Polish grammatical gender Polish people were chosen to participate in this study. Utilizing personal connections, a convenience sampling approach was employed for subject recruitment. Driven by the author's non-residence in Poland, the recruitment was done mainly online. Subjects were invited to participate via email or WhatsApp through personal connections. This way ensured the quickest response collection. Additionally, some participants were recruited through Instagram. The invitation did not state anything about grammatical gender, however, subjects were made aware that the study is on fragrance marketing. Subjects were not rewarded for their participation.

The sample size was 93, however, after extracting subjects who did not complete the survey the final size was $n = 83$. The aim was to have at least 30 participants per gender (women, men) based on the number of participants from Speed & Majid's (2016) study. The final group consisted of 66 female (80%) participants and 17 male participants. There was a clear gender imbalance in the sample. Despite the efforts, recruiting male subjects was significantly less effective. The mean age of participants was 39.8 years old, with a range from 16 to 69 years old.

Design

This experiment was a 2x3 mixed design [see Appendix D for an overview]. The independent between the subject's variable with two levels was the gender of the participant (male or female) and within the subject variable with two levels was the grammatical gender of perfume notes (feminine and masculine).

The distribution of grammatical gender variable levels occurred as follows: subjects saw an advertisement featuring 3 feminine grammatical gender scent notes first, followed by ads with alternating sequences of masculine and feminine notes. The ads were presented in an alternating sequence of masculine and feminine notes to avoid potential biases.

Instruments

The three dependent variables were purchase intention, attitude toward the product, and short-term memory. The intention to buy the product scale is based on Nederstigt and Hilberink-Schulpen (2018) and contains six semantic differentials on a scale of 1 to 7. The scale was slightly modified due to a specific need to find whether the participants want to

purchase the perfume congruent with their gender and not on a recommendation for others therefore one semantic differential based on “recommendation to others’ was omitted. The statements were "I want to buy this perfume" and "I would seek information about this perfume", and were rated from 1 least likely to 7 most likely. The reliability of purchase intention scale was very good ($\alpha = 0.95$). The attitude towards the product was also based on Nederstigt and Hilberink-Schulpen (2018) which was measured by 7 semantic differentials on a scale of 1 to 7. This study omitted statements on usefulness, additional value, and cheap-expensive differences because it does not apply to the goal of the study and therefore be based on 4 semantic differentials. The statement “*This product is...was followed by not nice-nice, not attractive, not appealing-appealing.*”. The reliability of attitude towards the product scale was very good ($\alpha = 0.92$). Lastly, for the recognition task, we listed perfume scents that were included in the advertisements.

Procedure

The main survey was designed on the Qualtrics platform after the results of the pre-test showed which scents were the most gender-neutral. The entire survey was in Polish language. The translation of survey questions on purchase intentions and product liking which were based on Nederstigt and Hilberink-Schulpen (2018) as mentioned earlier, was done by a Polish native speaker with the assistance of two other native Polish speakers to the validity of the content. It was challenging to not change the meaning of the questions and maintain the natural way of asking questions in the Polish language. The final wording of the questions was approved by all three Polish native speakers.

Subjects accessed the survey through the Qualtrics platform. First, they saw a short description that stated:

The experiment is conducted as part of the Global Communications studies at Radboud University in Nijmegen (Netherlands). The survey was created to collect opinions on perfume ads. This data will be used later in the product perception analysis. If you want to know more, send an e-mail to: ida.nowak@ru.nl.

Based on this information, subjects were aware of the aim of the study but did not know the study's focus. This decision was made to not influence responses in the survey. In addition, subjects had to give their consent to participate in the survey and to use the data for the research. Next, they answered demographic questions (gender, age, nationality). Additionally subjects were asked to confirm that Polish is their native language. Further, they were

randomly assigned to view one of two sets of six ads displayed with ingredients chosen from the pre-test, each set displayed had three perfume ads with feminine grammatical gender and three with masculine grammatical gender. The decision on making two sets of ads was to avoid people exchanging information as subjects were recruited through common connections with other subjects. This was especially important for the last segment of the survey where short-term memory was being measured. Subjects scored perfume based on purchase intention and attitude towards the product scales based on Speed & Majid (2016) by clicking on the presented scale [see Appendix E for scales in English]. Lastly, for the recognition task, they were presented with a list of perfume scents that were included in both sets; therefore, subjects only saw half of them, and then asked to evaluate whether they remembered the scent notes from viewed ads.

Statistical treatment

Data has two independent variables and three dependent variables therefore the analysis was done through three two-way mixed ANOVA tests.

5. Results

Purchase Intentions

To answer the first hypothesis *to what extent will the grammatical gender of fragrance notes affect the purchase intention of a potential customer based on gender congruency with customer gender* the two-way mixed ANOVA was performed. The within-subjects factor *grammatical gender of fragrance notes* with two levels (feminine and masculine) was assessed for the effect on the dependent variable *purchase intention* with between-subjects factor *sex of a subject* (men and women). It was found that grammatical gender and sex of a subject did not interact significantly ($F(1, 81) = 1.528, p = .220$). Similarly, the main effect of *grammatical gender of fragrance notes*, ($F(1, 81) = .859, p = .357$) and main effect of sex of a subject ($F(1, 81) = 0.868, p = .354$) were also not significant. Based on these results, it can be concluded that the grammatical gender of fragrance notes did not significantly influence participants' purchase intentions, and neither grammatical gender nor participants' gender significantly influenced participants' intentions.

Table 1. *Means and standard deviations for the Purchase Intention scale, with statements "I want to buy these perfume (1-7)" and "I would seek information about this product (1-7)"*

		<i>n</i>	<i>M</i>	<i>SD</i>
Masculine grammatical gender	Women	66	3.31	1.55
	Men	17	3.19	1.11
Feminine grammatical gender	Women	66	3.66	1.36
	Men	17	3.14	1.36

Product liking

To answer the second hypothesis that assumed Polish people will like the product with a grammatical gender of fragrance notes congruent to their own the two-way mixed ANOVA was performed. The within-subjects factor *grammatical gender of fragrance notes* with two levels (feminine and masculine) was tested to determine its impact on the dependent variable *attitude towards the product*. The between-subjects factor *sex of a subject* had two

levels (men and women). The main effect of *grammatical gender of fragrance notes* was not significant ($F(1, 81) = .111, p = .740$), hence, it did not significantly influence attitudes toward the product among participants. Additionally, the main effect of *sex of a subject* was also not significant ($F(1, 81) = 0.358, p = .551$). Similarly, the interaction between *grammatical gender of fragrance notes* and *sex of a subject* was non-significant ($F(1,81) = 1.103, p = .297$), suggesting that the relationship between grammatical gender and attitude did not differ based on participants' gender. Based on these results, it can be concluded that the grammatical gender of fragrance notes did not significantly influence participants' attitudes towards the product, and there was no significant interaction observed between grammatical gender and participant's gender in shaping their attitudes.

Table 2. *Means and standard deviations for Attitude Towards the Product. Scale statements ranged from "This perfume does not appeal to me (1)" to "This perfume appeals to me (7)," "This perfume is nothing for me (1)" to "This perfume is really for me (7)," and "I would not want to have this product (1)" to "I want to have this product (7)."*

		<i>n</i>	<i>M</i>	<i>SD</i>
Masculine	Women	66	3.80	1.57
grammatical	Men	17	3.74	1.24
gender				
Feminine	Women	66	4.02	1.49
grammatical	Men	17	3,63	1.45
gender				

Short-term Memory

To test third hypothesis that predicted that people will remember notes better with a grammatical gender congruent to their own a repeated measures analysis was conducted. The within-subjects factor was *grammatical gender of fragrance note* with two levels (feminine and masculine), and the between-subjects factor was the *sex of the subjects* (men and women). The main effect *grammatical gender of notes* was significant ($F(1, 81) = 7.296, p = .008$). The interaction effect between *grammatical gender of fragrance note* and *sex of the subjects* was not significant ($F(1, 81) = .120, p = .730$). Regarding the between-subjects effects, there were no significant differences in short -term memory mean scores between men and women ($F(1,$

81) = .003, $p = .764$). To further examine the significant effect the dataset was split based on participants' gender. Since the study had gender imbalance in participants it was crucial to investigate both sexes separately. Additional tests were performed in search for congruency effect. Regarding the analysis of the within-subjects effects for women, a significant main effect of *grammatical gender of notes* was observed ($F(1, 65) = 6.530, p = .013$). For the analysis of the within-subjects effects for men, no significant main effect of scent was found ($F(1, 16) = 3.429, p = .083$).

Overall, the findings suggest that the grammatical gender congruency of fragrance notes did not have a significant influence on their short-term memory. There was a significant main effect of grammatical gender. After examining it further it was found that women remembered feminine gendered scent better than masculine.

Table 3. *Results of Short-term Memory Test (correct answers were scored with 1 point, wrong answers were scored with 0 points).*

		<i>n</i>	<i>M</i>	<i>SD</i>
Masculine	Women	66	.81	.18
grammatical	Men	17	.81	.13
gender				
Feminine	Women	66	.88	.16
grammatical	Men	17	.90	.16
gender				

To sum up, these results show a pattern where grammatical gender did not significantly affect survey responses in regards to purchase intentions and attitude towards the product. The only significant difference was observed in short-term memory testing. The results demonstrated that grammatical gender congruency did influence short-term memory scores for women. Women showed better short-term memory for scent notes with grammatical gender congruent to their own gender. This effect was not observed in men, since there were no significant differences in short-term memory scores based on grammatical gender congruency.

6. Discussion and Conclusions

The study aimed to investigate the effects of grammatical gender in advertising on product liking, purchase intention, and short-term memory in the context of the Polish language. It focused on gender congruency between customers and the product. It was aimed to address the research question of to what extent will the grammatical gender of fragrance notes affect the purchase intention, product liking, and short-term memory of a potential Polish customer based on gender congruency with customer gender? Additionally, it was meant to confirm or reject three hypotheses. The first hypothesis stated that Polish people exhibit higher purchase intentions after viewing advertisements with a grammatical gender of fragrance notes congruent to their own more than incongruent ones (H1). The second hypothesis stated that Polish people will like a fragrance presented in advertisements with a grammatical gender of fragrance notes congruent to their own more than incongruent ones (H2). The third hypothesis stated that Polish people will remember scent notes better with a grammatical gender of fragrance notes congruent to their own better than incongruent ones (H3).

According to the results of the study, there is no direct correlation between grammatical gender and purchase intentions, ad liking. This is not in line with the claim by Boroditsky (2003), that grammatical gender can influence the perception of a product and whether it is subliminally categorized as a gendered product. Additionally, these results did not support claims by Maciuszek et al. (2019) and Haertlé et al, (2017) that it is possible to find an effect of gender categorization in the Polish language, and rather support the claims made by other researchers (Sera et al., 2002; Vigliocco et al., 2005; Clarke et al., 1981), that it might be impossible to observe in languages with more than two grammatical genders. However, there could be a certain limitation that caused this result. According to Bassetti (2007), people can be affected by other gendered languages they know. In their study, bilingual children had different responses to monolingual children. Therefore if some Polish participants were bilingual their responses might have been influenced by their second mother tongue. Additionally, Kurinski and Sera (2011) proved that people can also get influenced by another gendered language acquisition later in their life. Subjects in this study were not asked what other languages they speak, if there was a majority of participants speaking other languages than Polish with grammatical gender this could explain the lack of significant results.

Consequently, Spangenberg et al. (2006) claimed that implicit manipulations like the congruent smell in a store can trigger purchase intentions. However, this research did not have a significant effect on purchase intentions (H1). This could be due to a difference between smelling the scent and reading about the scent. Perhaps, subjects are not affected by words alone and by reading the description but by the actual smell. Another possible explanation could be that gender norms do not align with biological gender. In a study by Worth et al. (1992), authors highlighted that masculine people may prefer masculine brands, meanwhile, feminine people prefer feminine brands. However, masculine people tend to dislike feminine brands while feminine people tend to like masculine brands despite their preference for feminine ones. One of the limitations of this research was that subjects were asked for their biological gender and not whether they identified as masculine or feminine. As people have complex personalities, categorizing their femininity and masculinity can be challenging.

Furthermore, in this study, people did not exhibit a preference towards a fragrance with grammatical gender congruent to their biological gender. This result was not in line with assumptions made in the second hypothesis (H2) that was based on previously described literature namely, Milner & Fodness (1996). They claimed that people choose products that maybe be made to “fit” them. This may be due to a gender imbalance in participants. The majority of subjects were women. As previously discussed, Worth et al., (1992) claimed that men are more inclined to seek out products marketed towards them and may even dislike feminine products, meanwhile, women can appreciate both feminine and masculine products. This study included mostly female subjects. It can be speculated that having more male participants could change this result.

The third hypothesis predicted that Polish people would remember scent notes better with a grammatical gender of fragrance notes congruent to their own better than incongruent ones. This hypothesis was not supported. Surprisingly, all subjects, men and women, remembered scent notes with feminine grammatical gender better than masculine ones. This finding is not in line with claims made by Schweppe et al. (2009) and Speed & Majid (2016). Similarly to the first hypothesis, this could have been due to the difference between smelling the scent and reading about the scent. The subject may simply not connect the name of a scent with an actual smell of it. Another explanation would be that smelling simply activates a stronger response than reading a word.

In future research, it could be beneficial to conduct a larger-scale study with a more diverse sample that better represents the target population of Polish native speakers.

Especially with a 50/50 male-to-female ratio. Particularly regarding understanding men and their masculine preferences. One of the biggest limitations of this experiment was a lack of appropriate gender distribution. Additionally, future studies could include masculine women and feminine men as a separate group from people who identify with traditional gender roles. As discussed earlier, biological gender often does not define one's preferences. However, Poland is a country that still holds onto traditional gender roles more rigidly compared to some other European countries (Slany & Strzemecka, 2015). Thus it would be quite beneficial to include masculine women and feminine men, especially in a country with less strict gender roles. Gender is a very complex matter and studies on grammatical gender should expand more on the multidimensionality of its concept. Furthermore, the study did not consider the possibility of bilingual participants who could be affected by another language's grammatical gender. This could be solved by collecting information on other languages spoken by participants. Moreover, the pre-test considered creating a unisex list of scents but the authors did not measure whether the bottle and advisement itself were considered unisex by the public. Lastly, this experiment did not touch upon long-term memory and only considered short-term memory. Exploring long-term memory effects could be more relevant for marketing purposes.

This study contributes to the literature by shedding light on the influence of grammatical gender on languages with more than two grammatical genders. Additionally, it suggests a lack of correlation between grammatical gender and consumer behaviour. In addition, the study opens the door to further research into the intersection of language, and consumer behaviour, expanding our understanding of how decision-making processes interact. In practice, it can mean that marketers do not need to adjust advertising for Polish customers as there is not much benefit to it. With current knowledge, it is safe to say that there is no immediate effect on purchase intentions or attitudes toward the product with grammatical gender in the Polish language. In the case of cross-cultural marketing, the importance of the grammatical gender in language may not be as important as other cultural aspects. Before adjusting advertising for potential Polish customers, wider linguistic possibilities should be considered.

References:

- Bassetti, B. (2007). Bilingualism and thought: Grammatical gender and concepts of objects in Italian-German bilingual children. *International Journal of Bilingualism*, 11(3), 251–273. <https://doi.org/10.1177/13670069070110030101>
- Bandara, K., Shi, P., Bergmeir, C., Hewamalage, H., Tran, Q. T., & Seaman, B. (2019). Sales Demand Forecast in E-commerce Using a Long Short-Term Memory Neural Network Methodology. In *Lecture Notes in Computer Science* (pp. 462–474). *Springer Science+Business Media*. https://doi.org/10.1007/978-3-030-36718-3_39
- Beldad, A., Hegner, S. M., & Hoppen, J. (2016). The effect of virtual sales agent (VSA) gender – product gender congruence on product advice credibility, trust in VSA and online vendor, and purchase intention. *Computers in Human Behavior*, 60, 62–72. <https://doi.org/10.1016/j.chb.2016.02.046>
- Bird, M. M., & Ehrenberg, A. S. C. (1966). Intentions-to-Buy and claimed brand usage. *Journal of the Operational Research Society*. <https://doi.org/10.1057/jors.1966.5>
- Bisang, W. (2011b). Classifiers in East and Southeast Asian languages Counting and beyond. *De Gruyter Mouton*. <https://doi.org/10.1515/9783110811193.113>
- Boroditsky, L. (2001). Does Language Shape Thought?: Mandarin and English Speakers' Conceptions of Time. *Cognitive Psychology*, 43(1), 1–22. <https://doi.org/10.1006/cogp.2001.0748>
- Brislin, R. W. (1976). Comparative Research Methodology: Cross-Cultural Studies. *International Journal of Psychology*, 11(3), 215–229. <https://doi.org/10.1080/00207597608247359>
- Casasanto, D. (2011). Different Bodies, Different Minds. *Current Directions in Psychological Science*, 20(6), 378–383. <https://doi.org/10.1177/0963721411422058>
- Clarke, M. S. F., Losoff, A., McCracken, M. D., & Still, J. (1981). Gender Perception in Arabic and English. *Language Learning*, 31(1), 159–169. <https://doi.org/10.1111/j.1467-1770.1981.tb01377.x>
- Crafton, S. M., Hoffer, G. E., & Reilly, R. J. (1981). Testing the impact of recalls on the demand for automobiles. *Economic Inquiry*, 19(4), 694. Retrieved from <https://ru.idm.oclc.org/login?url=https://www.proquest.com/scholarly-journals/testing-impact-recalls-on-demand-automobiles/docview/1297301826/se-2>

- Davies, I., & Corbett, G. G. (1997). A cross-cultural study of colour grouping: Evidence for weak linguistic relativity. *British Journal of Psychology*, 88(3), 493–517.
<https://doi.org/10.1111/j.2044-8295.1997.tb02653.x>
- Debevec, K., & Iyer, E. S. (1986). The Influence of Spokespersons in Altering a Product's Gender Image: Implications for Advertising Effectiveness. *Journal of Advertising*, 15(4), 12–20. <https://doi.org/10.1080/00913367.1986.10673033>
- Fugate, D. L., & Phillips, J. J. (2010). Product gender perceptions and antecedents of product gender congruence. *Journal of Consumer Marketing*, 27(3), 251–261.
<https://doi.org/10.1108/07363761011038329>
- Gentner, D., & Goldin-Meadow, S. (2003b). Language in Mind: Advances in the Study of Language and Thought. *MIT Press EBooks*. <http://ci.nii.ac.jp/ncid/BA62019908>
- Grohmann, B. (2009). Gender Dimensions of Brand Personality. *Journal of Marketing Research*, 46(1), 105–119. <https://doi.org/10.1509/jmkr.46.1.105>
- Haertlé, I. (2017). Does Grammatical Gender Influence Perception? A Study of Polish and French Speakers. *Psychology of Language and Communication*, 21(1), 386–407.
<https://doi.org/10.1515/plc-2017-0019>
- Kurinski, E., & Sera, M. D. (2011). Does learning Spanish grammatical gender change English-speaking adults' categorization of inanimate objects? *Bilingualism: Language and Cognition*, 14(2), 203–220. <https://doi.org/10.1017/s1366728910000179>
- Kurz, P. I., Gonner, C., Bartnicka, M. M., & De Mulder, H. N. M. (2023). A table named James or a table named Maya? *Linguistics in the Netherlands*, 39, 143–157.
<https://doi.org/10.1075/avt.00066.kur>
- Lucy, J. A. (1997). Linguistic Relativity. *Annual Review of Anthropology*, 26(1), 291–312.
<https://doi.org/10.1146/annurev.anthro.26.1.291>
- Milner, L. M., & Fodness, D. (1996). Product gender perceptions: the case of China. *International Marketing Review*, 13(4), 40–51.
<https://doi.org/10.1108/02651339610127248>
- Morwitz, V. G., Steckel, J. H., & Gupta, A. (2007). When do purchase intentions predict sales? *International Journal of Forecasting*, 23(3), 347–364.
<https://doi.org/10.1016/j.ijforecast.2007.05.015>
- Neale, L., Robbie, R. I., & Martin, B. a. S. (2016). Gender identity and brand incongruence: when in doubt, pursue masculinity. *Journal of Strategic Marketing*, 24(5), 347–359.
<https://doi.org/10.1080/0965254x.2015.1011203>

- Nederstigt, U., & Hilberink-Schulpen, B. (2018). Advertising in a Foreign Language or the Consumers' Native Language? *Journal of International Consumer Marketing*, 30(1), 2–13. <https://doi.org/10.1080/08961530.2017.1363008>
- Nedungadi, P. (1990). Recall and Consumer Consideration Sets: Influencing Choice without Altering Brand Evaluations. *Journal of Consumer Research*, 17(3), 263. <https://doi.org/10.1086/208556>
- Imai, M., Schalk, L., Saalbach, H., & Okada, H. (2014). All Giraffes Have Female-Specific Properties: Influence of Grammatical Gender on Deductive Reasoning About Sex-Specific Properties in German Speakers. *Cognitive Science*, 38(3), 514–536. <https://doi.org/10.1111/cogs.12074>
- Phillips, W., & Boroditsky, L. (2003). Can Quirks of Grammar Affect the Way You Think? Grammatical Gender and Object Concepts. *Proceedings of the Annual Meeting of the Cognitive Science Society*, 25(25). <https://escholarship.org/content/qt31t455gf/qt31t455gf.pdf?t=os510g>
- Prewitt-Freilino, J. L., Caswell, T. A., & Laakso, E. K. (2012). The Gendering of Language: A Comparison of Gender Equality in Countries with Gendered, Natural Gender, and Genderless Languages. *Sex Roles*, 66(3–4), 268–281. <https://doi.org/10.1007/s11199-011-0083-5>
- Roberson, D., Davies, I., & Davidoff, J. (2000). Color categories are not universal: Replications and new evidence from a stone-age culture. *Journal of Experimental Psychology: General*, 129(3), 369–398. <https://doi.org/10.1037/0096-3445.129.3.369>
- Vigliocco, G., Vinson, D. R., Paganelli, F., & Dworzynski, K. (2005). Grammatical Gender Effects on Cognition: Implications for Language Learning and Language Use. *Journal of Experimental Psychology*, 134(4), 501–520. <https://doi.org/10.1037/0096-3445.134.4.501>
- Sera, M. D., Elieff, C., Forbes, J. R., Burch, M. M., Rodríguez, W. C., & Dubois, D. (2002). When language affects cognition and when it does not: An analysis of grammatical gender and classification. *Journal of Experimental Psychology*, 131(3), 377–397. <https://doi.org/10.1037/0096-3445.131.3.377>
- Schertzer, S. M., Laufer, D., Silvera, D. H., & McBride, J. B. (2008). A cross-cultural validation of a gender role identity scale in marketing. *International Marketing Review*, 25(3), 312–323. <https://doi.org/10.1108/02651330810877234>

- Schweppe, J., Rummer, R., & Fürstenberg, A. (2009). Beyond sentence boundaries: Grammatical gender information in short-term recall of texts. *Memory & Cognition*. <https://doi.org/10.3758/mc.37.1.73>
- Schmitt, B. H., & Zhang, S. L. (1998). Language Structure and Categorization: A Study of Classifiers in Consumer Cognition, Judgment, and Choice. *Journal of Consumer Research*, 25(2), 108–122. <https://doi.org/10.1086/209530>
- Slany, K., & Strzemecka, S. (2015). Gender Roles and Practices in Polish Migration Families in Norway through the Eyes of Children. *Studia Migracyjne - Przegląd Polonijny*, 41. <http://yadda.icm.edu.pl/yadda/element/bwmeta1.element.desklight-9db2cde5-789e-4a48-a98a-a0be7c19f3ef>
- Smeets, M. a. M., Schifferstein, H. N., Boelema, S. R., & Lensvelt-Mulders, G. J. L. M. (2008). The Odor Awareness Scale: A New Scale for Measuring Positive and Negative Odor Awareness. *Chemical Senses*, 33(8), 725–734. <https://doi.org/10.1093/chemse/bjn038>
- Spangenberg, E. R., Sprott, D. E., Grohmann, B., & Tracy, D. L. (2006). Gender-congruent ambient scent influences on approach and avoidance behaviors in a retail store. *Journal of Business Research*, 59(12), 1281–1287. <https://doi.org/10.1016/j.jbusres.2006.08.006>
- Speed, L., & Majid, A. (2016). Grammatical gender affects odor cognition. *Radboud University Nijmegen*. <https://repository.ubn.ru.nl/bitstream/handle/2066/159823/159823.pdf>
- Speed, L. J., & Majid, A. (2019). Linguistic features of fragrances: The role of grammatical gender and gender associations. *Attention, Perception & Psychophysics*, 81(6), 2063–2077. <https://doi.org/10.3758/s13414-019-01729-0>
- Unterbeck, B. (1994). Korean classifiers. *Theoretical issues in Korean linguistics*, 367–385.
- Weist, R. M., Lyytinen, P., Wysocka, J., & Atanassova, M. (1997). The interaction of language and thought in children's language acquisition: a crosslinguistic study. *Journal of Child Language*, 24(1), 81–121. <https://doi.org/10.1017/s0305000996003017>
- Wolff, P., & Holmes, K. J. (2010). Linguistic relativity. *Wiley Interdisciplinary Reviews: Cognitive Science*, 2(3), 253–265. <https://doi.org/10.1002/wcs.104>
- Worth, L. T., Smith, J. M., & Mackie, D. M. (1992). Gender schematicity and preference for gender-typed products. *Psychology & Marketing*, 9(1), 17–30. <https://doi.org/10.1002/mar.4220090104>

Appendix A:

Gendered value ratings of perfume notes in a pre-test, indicating the perceived level of gender association for each scent.

Scent	Grammatical Gender in Polish Language	<i>M</i>
Chestnut	Masculine	2,4
Clove	Masculine	0,8
Honey	Masculine	0,9
Juniper	Masculine	0,95
Moss	Masculine	3,55
Orange Blossom	Masculine	4,1
Cinnamon	Masculine	1
Grapefruit	Masculine	0,05
Saffron	Masculine	1,95
Pineapple	Masculine	1,45
Ginger	Masculine	1,55
Musk Mallow	Masculine	3,25
Suede	Masculine	2,15
Orris root	Masculine	3,5
Black pepper	Masculine	4,65
Oak	Masculine	3,85
Papyrus	Masculine	4,4
Jasmine	Masculine	5,4
Cedar	Masculine	3,85
Cognac	Masculine	6,4
Almond	Masculine	1,1
Amber	Masculine	0,05
Cardamon	Masculine	2,1
ambergris	Feminine	2,3
Benzoin	Feminine	3,15
Bergamot orange	Feminine	0,7
Cherry	Feminine	3,4
Coffee	Feminine	2,5
Dark chocolate	Feminine	0,45
Green tea	Feminine	0,65
Leather	Feminine	3,35
Lemon	Feminine	3,35
White pear	Feminine	1,75
Mineral water	Feminine	1
Mandarin	Feminine	1,74
Nutmeg	Feminine	2,95
Sea salt	Feminine	1,95
Praline	Feminine	2,1
Plum	Feminine	1,15
Patchouli	Feminine	1,3
Black currant	Feminine	0,25
Plum	Feminine	1,15
Vanilla	Feminine	4,14
Levander	Feminine	4,9
Papaya	Feminine	3,95
Turkish Rose	Feminine	5,8
Lily of the Valley	Feminine	4,45

Appendix B

Groups of scents for each advertisement and their average mean.

Masculine grammatical gender:

- cedar, clove, almond ($M = 1,92$)
- oak, cinnamon, honey ($M = 1,92$)
- moss, cardamon, grapefruit ($M = 1,90$)
- orris root, pineapple, juniper ($M = 1,97$)
- musk mallow, chestnut, amber ($M = 1,90$)
- suede, saffron, ginger ($M = 1,88$)

Feminine grammatical gender:

- cherry, salt, currant ($M = 1.87$)
- lemon, mandarin, green tea ($M = 1.92$)
- leather, patchouli, water ($M = 1.88$)
- benzoin, pear, bergamot ($M = 1.87$)
- nutmeg, amber, chocolate ($M = 1.90$)
- coffee, praline, plum ($M = 1.92$)

Appendix C

Advertisements used in the final survey. There were two sets of six advertisements each (three per one grammatical gender) therefore 12 advertisements with 36 notes in total; 18 notes with feminine grammatical gender and 18 notes with masculine grammatical gender in Polish.

Group 1. Feminine grammatical gender (top row), and masculine grammatical gender (bottom row).

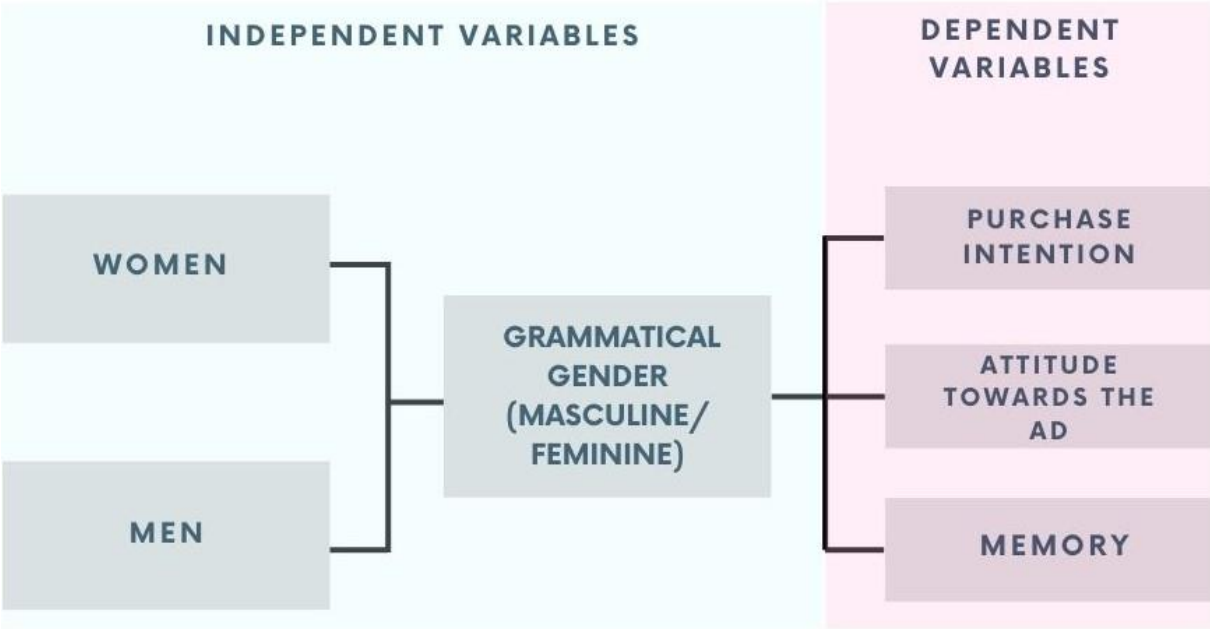


Group 2. Feminine grammatical gender (top row), and masculine grammatical gender (bottom row).



Appendix D

The research overview model



Appendix E

[One ad]

These perfume...

	1	2	3	4	5	6	7	
do not speak to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	speaks to me
are not for me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	are for me

These perfume...

	1	2	3	4	5	6	7	
are not pretty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	are pretty
are not attractive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	are attractive

I want...

	1 (least likely)	2	3	4	5	6	7 (most likely)
to have these perfume	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
to buy these perfume	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
look for information about these perfume	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>