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Figurative language and sensory perception: Corpus-based computer-assisted study of the nature and motivation of synesthetic metaphors in olive oil tasting notes

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The work presented in this MA thesis is, to the best of my knowledge and belief, original and my own work, except as acknowledged in the text. The work in this thesis has not been submitted, either in whole or in part, for a degree at this or any other university.

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List of abbreviations

CPP: Conceptual Preference Principle.

LFE: Lengua para Fines Específicos.

LSP: Language for Specific Purposes.

MIPVU: Metaphor Identification Procedure Vrije Universiteit.

OOTN: olive oil tasting notes.

RQ: research question.

UCREL: Lancaster University Centre for Computer Corpus Research on Language.

USAS: UCREL Semantic Analysis System.

Abstract

Meaning in sensory language is often built through figurative mechanisms, such as synesthetic metaphors, where a sensorial domain is used to talk about perceptions from a different sense, as in *green*[VISION] *aroma*[SMELL]. The motivation of synesthetic transfers of meaning has been studied in general and literary language, resulting in attempts to establish universals regarding the conceptual preference of the human senses. However, those universals have not been proven in any sensory LSP. The present work uses an LSP corpus of olive oil tasing notes to explore the nature of synesthetic metaphors, test existent models and identify tendencies which may explain this phenomenon in sensory language. The computer-assisted methodology followed consists of identifying semantic discordances and classifying synesthetic expressions in the discourse according to the source and target sensorial domains. Results show the inadequacy of existent models to explain synesthetic behavior in olive oil tasting language. The patterns found are discussed in the light of cognitive constraints and LSP and genre analysis to conclude that a multi-field approach is needed to explain the motivation of synesthetic transfers of meaning.

Keywords

Corpus linguistics, synesthetic metaphor, olive oil tasting LSP, LSP genre, cognitive linguistics.

Resumen

La construcción de significado en el lenguaje sensorial se da frecuentemente a través de mecanismos figurativos, como la metáfora sinestésica, en la cual un modo sensorial se utiliza para describir otro, como en *green*[VISIÓN] *aroma*[OLFATO]. La motivación de esta transferencia de significado se ha estudiado en el lenguaje general y literario, resultando en propuestas de universales que tratan de formular principios de preferencia conceptual de los sentidos humanos. Sin embargo, estos principios no se han comprobado en ningún LFE. El presente trabajo analiza un corpus de notas de cata de aceite de oliva con el fin de testar los modelos existentes e identificar tendencias que permitan explicar este fenómeno en el lenguaje sensorial. La metodología empleada, asistida por ordenador, consiste en identificar discordancias semánticas en el discurso y clasificar las expresiones sinestésicas según el modo sensorial origen y meta en la transferencia de significado. Los resultados muestran la ineficacia del modelo testado a la hora de explicar el comportamiento sinestésico en el lenguaje de la cata de aceite de oliva. Por tanto, los patrones observados se analizan desde las perspectivas de la cognición humana y las teorías de LFE y género textual para concluir abogando por la necesidad de análisis multidisciplinares para explicar las transferencias sinestésicas de significado.

Palabras clave

Lingüística del corpus, metáfora, sinestesia, LFE de la cata de aceite de oliva, género especializado, lingüística cognitiva.

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"If I have seen further it is by standing on the shoulders of giants."

(Isaac Newton, 1675)

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1. Introduction

Figurative language has long been studied, especially by literary and general language scholars (Lakoff & Turner, 1989; Cameron, 2003; Deignan, 2005; Steen, 2007; Kövecses, 2010; Shutova, 2010; among others). When figurative language is used in subjective specialized discourses, such as that of tasting, the behavior of meaning transfer and conceptual preference may change and not fit into predictions set by previous studies. Such seems to be the case of synesthetic metaphors and the Conceptual Preference Principle[1] (CPP) by Ulman (1945) and Shen & Gadir (2009). In their work, concreteness is proposed as the motivation behind a universal directionality of meaning transfer in cross-sensorial expressions (e. g., *sharp*[TOUCH] *scent*[SMELL]) along a particular hierarchy of the five senses (Vid. Infra section 2).

However, recent studies have anecdotally found some relevant instances of synesthetic expressions violating the CPP hierarchy and directionality, challenging the proposal as a frequency indicator rather than a universal principle (Caballero et al., 2019; Paradis, 2015; Strik Lievers, 2015). Although some works hint at this issue, to the best of my knowledge, none have systematically focused on synesthetic expressions in a sensory LSP in relation to sensorial hierarchy and conceptual preference. In addition, existing studies have followed methodologies which may be improved in terms of comprehensiveness, accuracy and efficiency because they are mostly based on manual and sometimes intuitive examination of texts (Vid. Infra section 3). Moreover, "[l]inguistic studies on the semantics of perceptual descriptions primarily represent sample analysis of particular terms or word fields" (Diedrich, 2015, p. 3). In this sense, there are

[1] CPP is used henceforth to refer to the sensorial hierarchy and the transfer directionality developed by Ullman (1945), Shen (1997), and Shen & Gadir (2009).

no studies either that aim at compiling an inventory[2] of synesthetic expressions in the discourse of olive oil tasting. This is of interest as "[n]ormed vocabularies are used by experts to develop and interpret instrumental methods and to analyze food products … [and] the study of scientific norming would benefit from a conceptualist approach to meaning" (Diedrich, 2015, p. 60). Thus, further research on the matter is needed to find whether (1) the CPP explains synesthesia in sensory LSP languages, such as that of olive oil tasting, either as a universal or as a frequency indicator; (2) methodologies for the identification of synesthetic expressions can be improved taking advantage of current theory and technology; (3) there is an explanation of synesthetic behavior that successfully accounts for results found in this and other works concerned with the issue; and (4) it is possible to provide a comprehensive set of lexical items whose meaning is affected by the process of synesthetic metaphorization. These synesthetic expressions may be incorporated into specialized reference tools to improve experts' and laypeople's knowledge of the discourse of food perception (Diedrich, 2015, p. 3).

In this context, the present study tries to contribute to Discourse and Genre Analysis, as well as Language for Specific Purposes (LSP) and Corpus Linguistics. More specifically, this work aims at answering the following research questions (RQ):

1. What is the set of synesthetic expressions that pervade the discourse of olive oil tasting?
2. Do existent models, namely the CPP, explain synesthetic construction of sensory meaning in specialized languages, more particularly, in that of olive oil tasting?
3. If not, do the data show any tendency at all in terms of synesthetic behavior?

[2] Understood in the present paper as a "listing of the items belonging to a particular level or area of description in a language" according to Crystal (2008, p. 254).

4. If so, do the observed patterns point towards any factor motivating synesthetic transfers of meaning other than closeness to the perceiver or the existence of specific organs, as assumed by previous models?

I will follow a methodology (section 3) based on corpus analysis (section 3.1) to identify and classify (section 3.2) synesthetic expressions in the specialized discourse of olive oil tasting notes (OOTN). The expressions identified (section 4.1, Appendix I) will be analyzed—in terms of source and target domain and directionality of the meaning transfer—in order to test the effectivity of existent proposals regarding the explanation of cross-sensorial conceptualization in sensory language. Results will reveal the difficulty of formulating principles that explain and predict synesthetic transfers of meaning universally (section 4.2). This is possibly due, on the one hand, to language being heavily determined by human innate cognitive constraints; and, on the other, to language existing at the service of and speakers' needs and aims (sections 4.3 and 4.4), which vary enormously among discourse communities, languages and cultures, as discussed in section 5. In spite of their motivation being unclear, the identification and normalization of linguistic expressions that manifest semantic changes is of vital relevance for successful communication within the discourse community of tasting and with the public.

2. State of the art: Identifying figurative language in sensory discourse

We know the world through our senses, but using language to communicate effectively our perceived reality and experience is not a simple task. Remarkably problematic is understanding meaning-making in sensory language, where perceptions are not only to be conceptualized but also communicated through language so that others understand the sensory meaning we want to transmit. On the one hand, when we ingest something, all sight, smell, taste and touch come into play synthetically (Paradis & Eeg-Olofsson, 2013, p. 17) into what Diedrich calls "food perception" (2015, p. 2). Thus, if we want to communicate our olfactive perception, it is hard to analyze that one stimulus without interference from other sensorial information (Caballero et al, 2019; Morrot et al., 2001). Another issue is the subjective nature of sensory perception: although "sensory meanings are concrete sensuously speaking" (Caballero et al., 2019, p. 34), they are also highly dependent on individual experiences—we know what a strawberry aroma is like only if we have previously eaten and smelled one. Besides, as noted by Viberg (2001, p. 1307), human perception is dominated by vision and hearing, a predilection which indeed takes a role in the construction and communication of sensory meaning.

On the other hand, this, together with a commonly perceived lack of vocabulary to address sensory information[3] (Suárez-Toste, 2017, p. 89), leads to yet another problem related to sensory language: expressing perceptions with accurate words in a way that others understand what we mean. In the words of Diedrich, "[t]he communicative situation in food science is complex, primarily due to the interaction of experts and non professionals" (2015, p. 61). On top of that, the meaning of sensory language is not static but dependent both on the speaker and the context, so

[3] See Paradis & Eeg-Olofsson (2013) and Majid & Buhrenhult (2014) for the case of smell.

that meaning becomes flexible and is determined by the context of use (Diedrich, 2015, p. 2). This may undermine unequivocal communication among specialists and between specialists and laypeople, who "aim to reach mutual understanding with the help of linguistic means" (Diedrich, 2015, p. 2). All these peculiarities reveal the complex relationship among reality, perception, cognition, language and communication—a symbiosis largely discussed by scholars but whose intricacies are still to be fully explored and explained.

Although perception is synthetical, subjective and linguistically elusive, developing strategies to build sensory meaning is conceivably natural; even more when reporting sensory perceptions through language is part of the activity of a professional community. Such is the case of tasters, who need not only to conceptualize and analyze their perceptions, but also to express them accurately and nuancedly using language. Studies on this subject (Caballero & Suárez-Toste, 2008; Gluck, 2003; Lehrer, 2009; Peynaud, 1987, to name but a few) have repeatedly pointed out that sensory discourse is pervaded by figurative uses of language—a research area still requiring deeper attention (Temmerman, 2000). For instance, in the wine tasting discourse, the use of synesthesia—a special type of metaphor—appears to be particularly salient in the construction of sensory meaning (Caballero & Suárez-Toste, 2010; López Arroyo & Roberts, 2017; Paradis, 2010; Paradis & Eeg-Olofsson, 2013; Suárez-Toste, 2007, 2017).

But wine, despite its colossal attractive for sensory language scholars, is not the only product which specialized professionals write organoleptic reports about in the form of tasting notes. That is the situation of olive oil, whose scientific and cultural interest has been exponentially growing in the international context in the last few years. Although olive oil tasting notes (OOTN) mirror wine tasting notes in many ways (López Arroyo & Sanz Valdivieso, 2021; Sanz Valdivieso & López Arroyo, 2020), they have not been as widely studied: to the best of my knowledge, most

research consists of works where olive oil language, including its agricultural and industrial aspects, mainly in Spanish, is taken as a marginal result of broader regional studies (González Blanco, 1999; Moya Corral, 1994). More recently, some more comprehensive linguistic works have explored the language of olive oil in general, even multilingually, but mostly with a lexicographic focus (Montoro del Arco, 2012; Roldán Vendrell, 2007, 2010, 2013; Santa María, 2013). In view of these circumstances, it is reasonable to assume that a study of OOTN may provide an adequate, rich and relatively unexplored ground for research on synesthesia in sensory language, since the motivation of this meaning transfer has not been successfully determined yet. Similarly, there is no account of frequent synesthetic expressions that answers language users' "specific need to achieve mutual understanding" (Diedrich, 2015, p. 4) in these specialized contexts.

Synesthesia, defined within the Conceptual Metaphor Theory (CMT) (Lakoff & Johnson, 1980), "refers to a metaphorical process of transfer from one sensory modality (source) to another (target): a perceptual experience related to one sense is described through lexical means typically associated with a different sense" (Strik Lievers, 2015, p. 69). Although synesthesia has traditionally been accepted to be a type of metaphor, there has been some controversy in Semantics suggesting that this particular kind of meaning transfer is part of a metonymical process rather than a metaphorical one (Paradis, 2015; Paradis et al., 2019; Paradis & Olofsson, 2013; Rakova, 2003). These voices argue that, in expressions such as *soft taste*, *soft* is taken for granted to be polysemous and so have a "more basic, or literal meaning [related to TOUCH] and an extended meaning" (related to TASTE) (Paradis & Olofsson, 2013, p. 15). This implies that, when related to *taste*, *soft* is taking a different sense in the domain of TASTE (metaphorization), so that "*soft mouth-feel* is the only congruent, literal meaning" (Paradis et al, 2019, p. 67). However, as pointed out by these authors,

scholars taking this view have not explicitly explained how these words are indeed polysemous so a metaphor proper is the transfer that occurs. Instead of metaphorical transfers, the meaning of these expressions may answer to a "zone activation" within the same sense (monosemy), which would give place to a metonymical transfer (Paradis et al., 2019, p. 70; Paradis & Olofsson, 2013, p. 15). For these authors, expressions such as *soft taste* "are just used with the focus on one or the other of the sensory perceptions through a process of synesthetic metonymization, a construal of salience, which makes use of WHOLE FOR PART configuration" (Paradis & Olofsson, 2013, p. 17).

These considerations are a solid ground for a potential re-definition of synesthetic transfers of meaning, but "it is not clear what the value of these observations are [sic]" (Paradis & Olofsson, 2013, p. 15). In fact, this issue is part of a larger Historical and Cognitive Linguistics debate which is most likely unsolvable (Paradis & Olofsson, 2013, p. 15): it is impossible to empirically determine the original sense(s) and usage(s) of a word. Hence, we cannot certainly affirm that the meaning behind a particular in-context instance of that word answers either (a) to the activation of a different sense (polysemy, in which case synesthesia would be considered a metaphorical process); or (b) to an extension of meaning to another domain through zone-activation within the same sense (monosemy, entailing a metonymical process) (Paradis & Olofsson, 2013, p. 15). Because of this epistemological cul-de-sac, for the sake of results' comparability, and due to the metaphorical approach's demonstrated "importance for the proposal of unidirectionality of semantic change through meaning extensions" (Paradis & Olofsson, 2013, p. 15), the present work assumes the traditional CMT-based approach, and synesthesia is addressed using the term *metaphorical* transfer.

Within this concept of synesthesia, the literature provides a wide arrange of works trying to explain the motivation behind cross-modality in linguistic expressions of sensory perceptions

in general and literary language (Strik Lievers, 2015; Tsur, 2007; Ullman, 1945). Most relevant and commonly accepted in this attempt are the hierarchy and directionality proposed by Ullman (1945) and the Conceptual Preference Principle (CPP) later developed by Shen (1997) and then Shen & Gadir (2009). Essentially, they claim that the transfer directionality acts hierarchically from lower to higher domains on the basis of closeness to the perceiver and the existence of specific organs; this is, TOUCH → TASTE → SMELL → SOUND → VISION, as *warm light* (TOUCH → VISION), but not *green aroma* (SMELL *← VISION) (Shen & Gadir, 2009, p. 6). As Suárez-Toste (2017, p. 91) states, this rationale conforms to the CMT, as it respects the notions of grounding and embodiment[4]—which entail that "understanding … requires a grounding in experience" (Lakoff & Johnson, 1980, p. 181) and that "metaphorical meanings are given by conceptual metaphorical mappings that ultimately arise from correlations in our embodied experience" (1980, p. 248). Not only that, Suárez-Toste (2017, p. 91) explains that the CPP also complies with the premise that metaphors "restrict source and target domains only by requiring that the source be a specific-level schema and the target a generic-level schema" (Lakoff & Turner, 1989, p. 162); this is, that meaning transfers occur on the basis of concreteness. However, as noted above, more recent studies have tangentially found some instances of synesthetic expressions not complying with the CPP, which suggest that it is not a universal principle (Caballero et al., 2019; Paradis, 2015; Strik Lievers, 2015).

All these studies on synesthetic language are based on methodologies consisting of discerning semantic discordances within the dominant domain of the discourse under study (Caballero & Suárez-Toste, 2010, p. 271; see also Paradis, 2015; Shutova, 2010; Steen, 2007;

[4] Nevertheless, there have been examples found of metaphors not necessarily complying with the CMT aspects of grounding and embodiment (Kövecses, 2005).

Steen et al., 2010; Strik Lievers et al., 2013). Deignan (2005) outlines different possibilities to find those discordances: to "list potential realizations" of a conceptual metaphor and trawl them in the corpus, where the researcher intuitively decides whether there is a metaphorical use in each case or not (2005, p. 93); or to start from a small corpus, search it by hand, and generalize the findings into a larger corpus (Cameron & Deignan, 2003). Many different variations of these possibilities have been used by metaphor researchers. Ullman (1945) studied synesthesia in the poetical works of Keats and Byron following a completely manual and intuitive methodology. Shen & Gadir built their CPP after conducting interpretation generation tasks of artificially created and isolated synesthetic expressions; while in fact acknowledging the potential relevance of contextual factors in this phenomenon (2009, p. 13). Strik Lievers (2015), following Deignan's (2005, p. 93) suggestion, compiled a vocabulary of sensory-related words to be queried in the corpora she studied to find cross-domain transfers in the context of those words.

Steen et al. (2010) developed the Metaphor Identification Procedure Vrije Universiteit (MIPVU) (2010, p. 25). In few words, the gist of the method is recognizing "incongruences" (Cameron, 2003) among lexical units in the main discourse domain. These incongruences exist "because we can find some other way of interpreting the word or phrase that contrasts with the discourse-appropriate interpretation" (Cameron, 2003, p. 4), as in *green scent*: a scent cannot be green, as green is a color exclusively perceivable through sight and not smell. However, we are able to understand *green scent* because a second condition is that this incongruity "can be resolved by some 'transfer of meaning'" from the source to the target lexical element (Cameron, 2003, p. 60). In other words, we must be able to find a parallelism in the comparison that allows for a

construction of meaning that is discourse-appropriate[5]: in the case of *green scent*, we may understand the parallelism of *green* as a color with *green* as in unripe, as that is the color usually present in immature vegetables.

When such a shift from the referential domain of the text is perceived, said lexical unit should be marked as metaphorical. These lexical units, as defined in Steen et al. (2010, pp. 26–32), do not need to be together in the text or in the same sentence nor be directly linked by syntax or grammar, and substitution elements (as pronouns) and ellipsis are comprehended too. This means that the unit of analysis is the text and that all linguistic forms of cross-domain comparison are to be considered metaphorical, and not only a limited set of lexical items, such as in Shen & Gadir (2009), where only de-contextualized noun-noun constructions are studied. This "frame semantic analysis" (Diedrich, 2015, p. 63) allows for the consideration of a lexeme's context, hence recognizing through the methodology that sensory meaning is context sensitive. The concept of frames includes both linguistic frames (in-text linguistic context) and cognitive frames (those contexts activated during the tasting activity, in this case) (Diedrich, 2015, p. 72). The latter are pre-defined by the fact that OOTN is a genre belonging to a specialized sensory discourse, while the former, focus of this study, are considered by examining the complete text during the identification of potential discordances that give place to synesthetic expressions. Hence, the present paper follows the MIPVU (Steen et al., 2010) in order to identify synesthetic expressions since it offers a comprehensive framework that fits the aims of this work.

[5] This is associated with the activation of conventional specific cognitive frames: "[g]eneral frames represent the stereotypical knowledge associated with a lexical item/concept. Specific frames capture the conceptual information that is linked to a specific instance of a word in a particular context." (Diedrich, 2015, pp. 76–77).

3. Materials and methodology

3.1. Corpus description

The methodology followed is based on a Corpus Linguistics approach. A corpus is "a collection of pieces of language that are selected and ordered according to explicit linguistic criteria in order to be used as a sample of the language" (Sinclair, 1995, p. 14). The present paper uses a corpus of OOTN to study sensory language empirically. Samples belonging to the OOTN genre are conventionalized texts which share the purpose of reflecting linguistically the sensory experience evoked by an olive oil sample. The genre approach is useful for research since "a given genre within the range of discourse practices of a community provides researchers with a manageable and situated research context" (Caballero et al., 2019, p. 18). Tasting notes, being a LSP genre, allow for systematic discourse research methods because genres provide standard factors in the object of analysis—samples of a genre share linguistic and extra-linguistic features (terminology, rhetorical structure, purpose, participants, etc.) (Swales, 1990, p. 58). Applying this approach to the analysis of the data entails having those features already defined, which are essentially a range of variables in the communicative event under study. In sum, having those extra-linguistic factors defined helps narrow the uncontrolled factors: if we know the purpose and the intended audience, among others, we can link those to a possible explanation behind the results obtained once the corpus is analyzed, instead of hypothesizing about a possible factor determining a particular behavior.

Much of the reliability and validity of results from a corpus analysis is determined by the corpus' qualitative and quantitative representativeness (Seghiri, 2015, p. 142), which, in turn, depends on the compilation criteria followed by the researcher (Sinclair, 1995, p. 245). To

formalize qualitative representativeness, Biber (1993) elaborated a set of parameters to be considered when taking "sampling decisions" (1993, p. 245): channel, format, setting, participants, factuality, purpose and topic. In this sense, the corpus used in this study is a compilation of written, online-published, factual and opinion texts on the topic of olive oil tasting with the purpose of describing and evaluating the organoleptic attributes of an oil sample. Regarding participants, "[t]he communicative situation in sensory science includes interaction both among professionals and between experts and consumers. The challenge of this situation derives from the interlocutors' varying knowledge of the field" (Diedrich, 2015, p. 43). In OOTN, the addressees are highly variable and do not necessarily have the same level of expertise as addressors, who range from olive oil presses trying to sell their product, to critics providing professional evaluations of an oil sample, and amateur tasters sharing their impressions online (Sanz Valdivieso & López Arroyo, 2020, p. 31). Samples written by each of these writer profiles were included in the corpus so that the analysis is as representative as possible of the olive oil tasting discourse community.

As part of these criteria, I selected OOTN published online and written originally in English by oil producers, critics and amateur tasters. A qualitative criterion was set to perform institutional searches that linked to official olive oil webpages, distributors or contests. From those reliable specialized and institutional sources, all available tasting notes were stored as samples for the corpus with the purpose of achieving the greater size and variety possible. This is due to the lack of published OOTN in comparison to, for instance, the innumerable wine tasting notes one can find online due to the popularity of olive oil tasting being incredibly recent. In this context, OOTN written by producers were selected from olive oil mills' webpages such as Moonshadow Grove or Rio Bravo Rach found in sites such as the International Olive Council or the California Olive Oil Council; critics' OOTN were selected from sources such as the Flos Olei Guide, for instances, or

the EVOOLEUM Guide, a compilation of expert tasting panels' tasting notes; and amateurs' OOTN were selected from online communities such as the Olive Oil Online Forum. These three sub-corpora were intended to be as balanced as possible, resulting in 250 samples belonging to the press sub-corpus (8,850 words); 230 samples to the critics sub-corpus (9,715 words); and 140 samples to the amateur sub-corpus (2,290 words).

Each of those samples was labelled to codify relevant extra-linguistic information: an ID number, field they belong to (olive oil tasting in all cases), addressor (tagged as press, critics or blog), press producing each oil sample, olive variety of each oil sample (up to total of 40 varieties), date of publication, and language (English in all cases). For instances, the label 0108_OT_PR_OPR_MZ_18_EN indicates the sample is the olive oil tasting note (OT) number 108 within the English (EN) press sub-corpus (PR), written in the year 2018 by the California-based mill The Olive Oil Press (OPR) to describe an oil made from the Manzanilla (MZ) olive variety.

After these considerations, the dataset used in this study can be defined as ad-hoc domain-specific monolingual corpus (Corpas & Seghiri, 2009, p. 78) containing 620 OOTN and 20,855 words. The corpus' quantitative representativeness (Seghiri, 2016, p. 386) was confirmed using Recor, a software developed by Corpas & Seghiri (2007). This tool performs an N-Cor algorithm-based quantitative analysis, using the type/token ratio to determine the corpus' representativeness in terms of its size and lexical density (Seghiri, 2016, p. 386), shown in the graphs A and B (Figure 1). Graph A shows the minimum samples the corpus needs to be representative based on a correlation of the type/token ratio (vertical axis) and the number of files (horizontal axis). Similarly, graph B helps determine the total tokens the corpus needs to achieve representativeness

based on a correlation of the type/token ratio (vertical axis) and the number of tokens (horizontal axis).

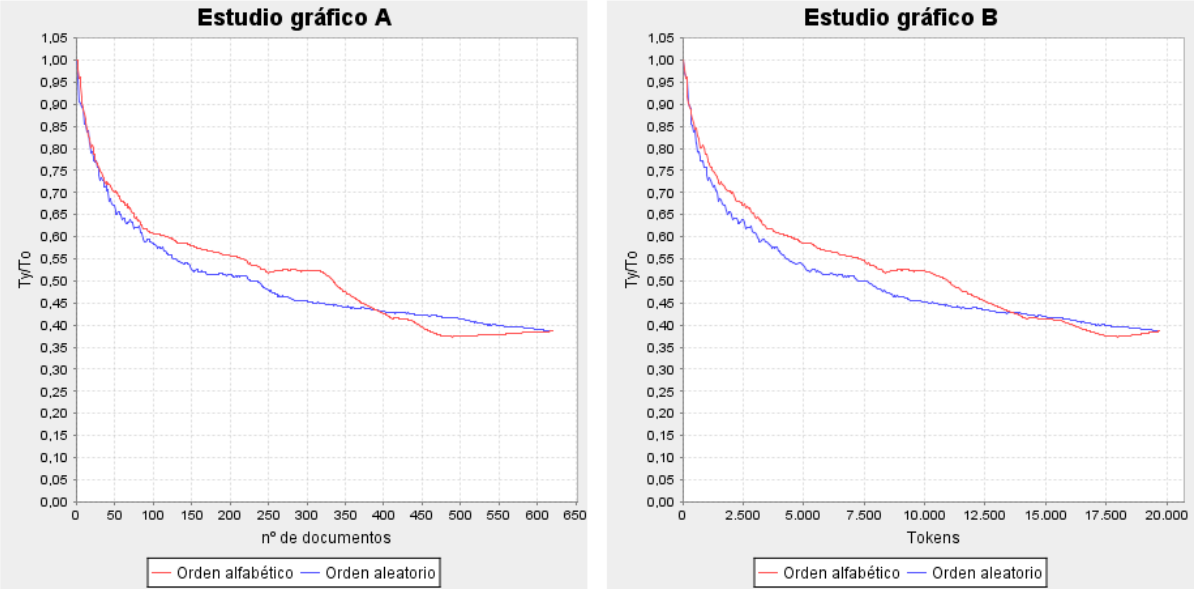

Figure 1. Olive oil tasting notes corpus representativeness graph output by Recor.

As the number of texts and tokens increases, both lines show an exponential decrease. At the point where the lines stabilize and meet each other, we see how many texts and tokens make our corpus representative. In this case, Recor output suggests that my corpus started to be representative with approximately 400 samples and 13,000 tokens.

3.2. Methodology

Synesthesia has traditionally been identified by manually reading through the corpus, which is "a very long and painstaking process …, the results of which may not justify the time and effort involved" (López-Arroyo & Roberts, 2017, p. 143). At the same time, completely manual analyses are more heuristic and intuitive than empiric and systematic, and hence not a fully reliable methodological framework for scientific research. This paper follows the MIPVU (Vid. Supra

section 2) in combination with computer software—i.e., taggers (USAS), concondancers (Sketch Engine) and dictionaries (Merriam-Webster)—to help semi-automatize the process.

Because current technology provides improved analytical tools, the corpus was semantically annotated by the automatic UCREL Semantic Analysis System (USAS) developed at the University of Lancaster (Piao et al., 2003). USAS tags lexical units according to semantic fields, i.e., tags classify groups of word senses connected at some level of generality with the same mental concept (Garside et al., 1997). Semantic fields connect, by definition, the notions of lexical senses and conceptual domains. This makes tag-based analysis a methodology that allows for an interrelated, more productive—although not completely simultaneous—identification of synesthetic metaphors and their source-target domain alignment in the linguistic expressions. I examined USAS tagset to select those tags relevant for the analysis of sensory language: tags _X3 (*Sensory*[6]), _O4 (*Physical attributes*[7]) and _K2 (*Music and related activities*). Some keywords were also targeted, more particularly *nose*, *mouth* and *palate* (under the tag _B1, *Anatomy and physiology*), as they are used to metonymically refer to the smell, taste and mouthfeel of wine (Caballero & Suárez-Toste, 2010, p. 269) as well as of olive oil (Sanz Valdivieso & López Arroyo, 2020, p. 29).

These four tags were queried in the corpus with the Sketch Engine concordance tool. Their textual-level context of occurrence was manually examined in order not only to detect their combination with incongruent sensorial modes (in which case an expression was identified as an instance of synesthesia), but also to identify those clashing domains (and so establish the mapping

[6] Subdivided into _X3.1. (*Taste*), _X3.2. (*Sound*), _X3.3. (*Touch*), _X3.4. (*Sight*) and _X3.5. (*Smell*).
[7] _O4.1. is *General appearance and physical properties*; _O4.2. is *Judgement of appearance*; _O4.3. is *Colour and colour patterns*; _O4.4. is *Shape*; _O4.5. is *Texture*; and _O4.6. is *Temperature*.

of each transfer). For instance, consider the following extract from the semantically tagged corpus of OOTN:

(1) Its_Z8 **flavour_X3.1** is_A3+ incredibly_A13.3 **smooth_O4.5** , … ._PUNC

When searching the corpus for _X3 tags, *flavour* appears and, when examining its context in the concordance line for tag _X3, I find *smooth*. Because the tags _X3.1 (*Taste*) and _O4.5 (*Texture*) are not coherent (_X3.1 ≠ _O4.5), this extract is to be identified as a synesthetic expression[8]. At the same time, the source and target domains and the directionality of the transfer can be accounted for as well, being an upwards transfer from TOUCH (*smooth*) to TASTE (*flavour*), thus complying with the CPP.

Using USAS for the application of the MIPVU in my corpus provided a more accurate, objective, efficient and replicable methodology[9] for the identification of synesthetic metaphors. Not only that, the inclusion of USAS in this approach may pose an advantage also because linguists concerned with metaphor usually distinguish (1) the identification of metaphorical uses of language from (2) the mapping of the source-target domains as two different research questions (Cameron, 2003; Steen, 2007; Steen et al., 2010). Nevertheless, USAS' tagset allows for the identification of both the incongruence and the source and target domains involved in the mapping: in *clean*_O4.2 *tasting*_X3.1, tag _O4.2 (*Judgement of appearance*) is incongruent with tag _X3.1

[8] In adjective-noun items, I focus on property descriptors (*warm aroma*) as opposed to object descriptors (*strawberry aroma*) because meaning-making in the latter consists of the salience of one of the readings, or "zone activation", and not of a cross-sensorial conceptualization (Caballero et al., 2019, p. 70).

[9] USAS software is available for the analysis of 12 languages. USAS tagset consists of 21 major discourse domains, initially based on the *Longman Lexicon of Contemporary English* (McArthur, 1981) and the *Comprehensive Grammar of the English Language* (Quirk et al., 1985).

(*Taste*). This led me not only to mark this segment as metaphorical, but also to classify it as TASTE *← VISION transfer thanks to the tags included in the segment (see also (1) above).

At the same time, because language cannot be completely analyzed by computers yet, the first sense appearing in the Merriam-Webster Dictionary was used to disambiguate possible cases of computer errors in tagging or classification difficulties during the analysis, this is, to clean of noise the automatic output.

Following this methodology, synesthetic metaphors were identified by looking at the concordances of USAS' tags related to sensory perceptions, and not manually or intuitively, in contrast to previous studies (Vid. Supra section 2). Then, synesthetic instantiations were classified according to both the source and target sensorial domains and to the directionality proposed by the CPP model to test its applicability in OOTN figurative use of language (Figure 2 below).

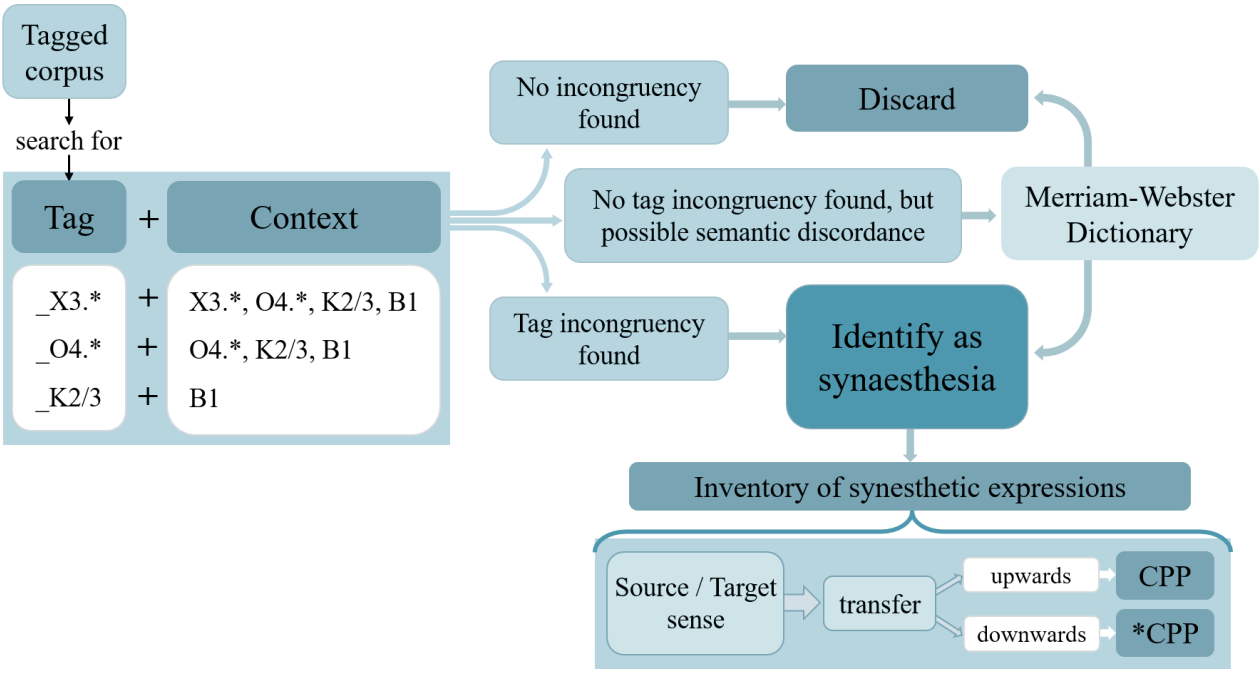

Figure 2. Methodology used for the identification and classification of synesthetic expressions.

Results were interpreted in terms of the hierarchy and directionality of the sensorial transfers according to the CPP, which may contribute to shed light on patterns in the figurative use of language of the olive oil tasting discourse community and their ascription to existent models. This methodology did not only serve the purpose of analyzing sensory conceptual preference in OOTN and testing current models of synesthetic transfer; it also enabled the compilation of an inventory of synesthetic expressions frequently used in the olive oil tasting discourse to help olive oil tasting experts, technical writers, learners and amateurs to communicate successfully. This will contribute to the future development of reference tools that "enable communication between experts and consumers" (Diedrich, 2015, p. 61). This is an application that, in view of the lack of agreement on terminology, is beneficial in a twofold way: first, it will help provide accurate and consistent expert-to-expert communication; and, second, it will be useful for the training of future experts. These are challenging aims in sensory analysis, according to Diedrich, due both to the subjective nature of the activity and to the participation of consumers in the conversation, which often leads to miscommunication (2015, p. 44). Hence, even if partial, taking the first steps towards an inventory of synesthetic metaphors in OOTN is a valuable expected outcome intended to contribute to successful communication in the discourse community of olive oil tasting.

4. Results and discussion

4.1. RQ 1: Identifying an inventory of synesthetic expressions in OOTN

A total of 312 occurrences of 127 different linguistic expressions of synesthesia were identified in the corpus based on the discordances in the tagged output of USAS[10] (Vid. Supra section 3). All synesthetic expressions found are presented in Appendix I isolated and in alphabetic order, in hopes of contributing to the development of a specialized reference tool in the future, as mentioned above.

The analysis of the semantically tagged corpus revealed a wide variety of linguistic expressions: 174 expressions in the form of A + N (55.77% of the occurrences); 48 in the form of N + *to be* + A (15.38%); and 45 (14.42%) in the form of N + PP were easily identified as in (2), (3), (4) and (5) below. The remaining 45 (14.42%) took a variety of forms and required some syntactic analysis and deictic tracing as transfers were more extended along the text, as in (6) and (7). Together with this, 62 of all the occurrences (19.87%) had a noun such as *notes* or *hints* as the expression of the target or source domain of the transfers, as in (8), (9) and (10); and 44 (14.10%) contained a source or target domain expression that gave place to more than one synesthetic transfer, as in (11) and (12).

(2) **PALATE**[TASTE]

Sharp[TOUCH] notes of green olives …

(3) **Sweet** [TASTE] **texture**[TOUCH] …

[10] For clarity purposes, synesthetic expressions in the examples and in Appendix I are presented clean of USAS tags.

(4) Its **aroma**[SMELL] is **clean**[VISION] and complex …

(5) … buttery **flavor**[TASTE] with a hint of **green**[VISION] …

(6) Attractive in the **nose**[SMELL], displaying entirely **green**[VISION] notes of freshly-mown grass …

(7) The **bouquet**[SMELL] opens with delicate hints of grass and almonds **embellishing**[VISION] the impressive fruitiness of this oil …

In (2), there is not any syntactic-grammatical relationship between *PALATE*[TASTE] and *Sharp*[TOUCH], but the transfer meaning TOUCH → TASTE can still be identified—*PALATE* being a heading for the next sentence indicates that TASTE is the referential domain in the text, broken by a lexical item conveying TOUCH. Instances (3) and (4) show a clear semantic discordance between the adjective and the modified noun within the adjectival phrase (TASTE → TOUCH and VISION → SMELL transfers, respectively). Similarly, (5) shows a semantic discordance between the noun head of the nominal phrase and the noun in the prepositional phrase (VISION → TASTE). However, other instances were not so obvious, as in (6), where the noun *nose*[SMELL] is immediately followed by a gerund verb whose direct object is pre-modified by the adjective *green*[VISION]. Likewise, the discordance in (7) consists of a noun (*bouquet*[SMELL]) that establishes SMELL as the dominant domain of the sentence, followed by a noun (*hints*) *embellishing*[VISION] the oil.

In fact, the abundance of nouns like *hints* created instances where the target domain was unclear, as in (8), (9) and (10):

(8) We pick these olives in the middle of the season to balance the **sharper**[TOUCH] and **softer**[TOUCH] **notes**[SMELL/TASTE] of the fruit.

(9) This balanced estate oil **shines**[VISION] with **notes**[SMELL/TASTE] of arugula and artichoke.

(10) This EVOO has great fruit character and displays a **clean**[VISION] and persistent fresh **fruitiness**[SMELL/TASTE] with evident notes of green apple, green tomato, herbs, …

In (8), (9) and (10), *notes* and *fruitiness* may involve either SMELL or TASTE, but the target sensory modality is undistinguishable due to lack of context, as there is no cue in the text that disambiguates in one sense or another. However, because either mapping would not affect the directionality of the cross-modal transfer along the hierarchy, the category SMELL/TASTE was created to allocate these expressions.

There were some other instances where, as in (8), there is not a one-to-one relationship among the lexical units involved in the cross-modal transfer of meaning: both adjectives (*sharper*[TOUCH] and *softer*[TOUCH]) pre-modify the same noun (*notes*[SMELL/TASTE]). Although in (8) both adjectives belong to the same sensorial domain, there were also cases where more than one semantic discordance involved a single lexical unit, such as (11) and (12):

(11) medium **harmonious**[SOUND] **green**[VISION] **fruitiness**[SMELL/TASTE] …

(12) **aroma**[SMELL] and **taste**[TASTE] are undeniably **green**[VISION] …

In (11), the noun *fruitiness*[SMELL/TASTE] is pre-modified by two adjectives related to two different sensorial domains, SOUND and VISION, respectively. In (12), two coordinated nouns, *aroma*[SMELL] and *taste*[TASTE], each related to a different sense, are followed by a copular verb and the adjective *green*[VISION], related to a third sensorial modality. These expressions were treated as independent synesthetic transfers; this is, *harmonious fruitiness*[SOUND → SMELL/TASTE] and *green fruitiness*[VISION →

[SMELL/TASTE], on the one hand, and *aroma is green* [VISION → SMELL] and *taste is green* [VISION → TASTE] on the other.

These instances (2-12) illustrate the difficulties in the identification and classification of synesthetic expressions; and, most importantly, that computer analysis is of significant utility to obtain not-so-raw data. However, they are also proof that the manual post-editing process to clean automatic output is an unavoidable and essential part of the methodology.

4.2. RQ 2: Applicability of the CPP model

When all the different realizations of synesthetic metaphors were identified, I classified them according to their source and target sensorial domains in order to study the directionality of the meaning transfers along the hierarchy proposed in the CPP. Table 1 below shows the itemized distribution of all cross-modal transfers (D = downwards transfer, U = upwards transfer).

Source \ Target	VISION	SMELL	SMELL/TASTE	TASTE	TOUCH
VISION		49 = 15.71% (D)	34 = 10.90% (D)	27 = 8.65% (D)	19 = 6.09% (D)
SOUND	0	10 = 3.21% (D)	18 = 5.77% (D)	37 = 11.86% (D)	1 = 0.32% (D)
SMELL	0		0	3 = 0.96% (D)	0
TASTE	0	5 = 1.60% (U)	0		3 = 0.96% (D)
TOUCH	1 = 0.32% (U)	27 = 8.65% (U)	10 = 3.21% (U)	**68 = 21.79% (U)**	

Table 1. Distribution of cross-modal transfers in OOTN according to the CPP hierarchy of senses.

Table 1 shows that the most common pattern is TOUCH → TASTE—and thus CPP-compliant upwards directionality. However, most synesthetic expressions involve higher senses as source modes and lower senses as target modes, this is, downwards transfers. In fact, results regarding

the directionality of the cross-modal transfers blatantly violate the CPP: almost two thirds of the transfers go downwards in the hierarchy and only one third complies with the CPP (Figure 3).

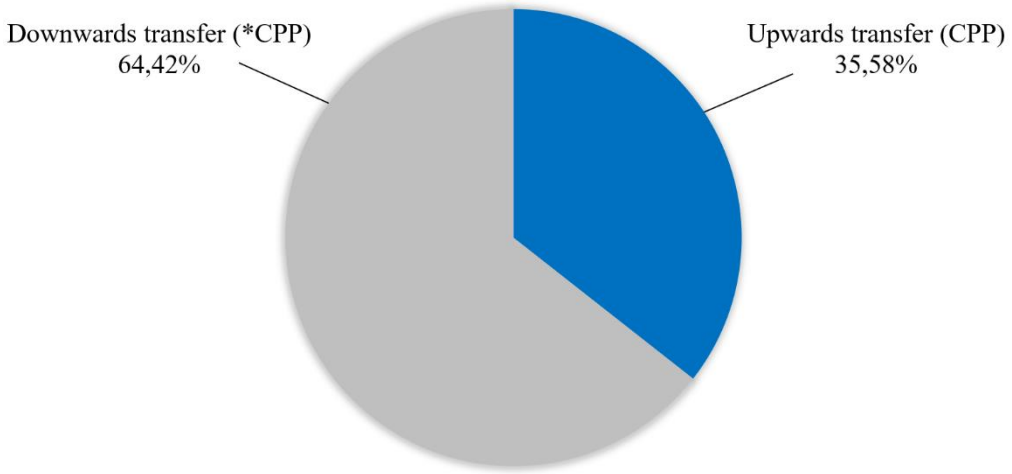

Figure 3. Transfer directionality in synesthetic expressions according to the CPP.

Given that the CPP directionality does not apply to the OOTN corpus, all cross-modal transfers (Figure 4, inspired in Strik Lievers, 2015) were examined separately according to each sensory modality. This was aimed at finding any pattern in the source and target alignment that could help account for the failure of the CPP to explain synesthesia in the corpus.

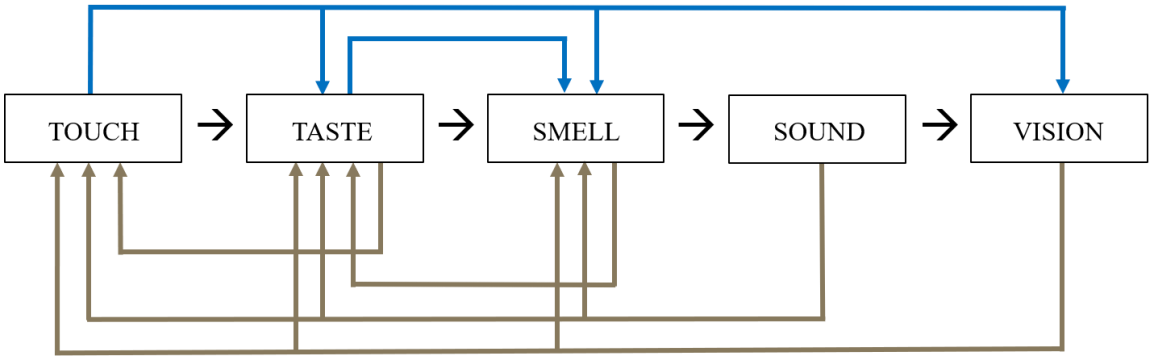

Figure 4. Synesthetic transfer flux in the corpus considering CPP hierarchy.

Figure 4 shows how synesthetic transfers of meaning works in the corpus, being blue lines indicative of upwards transfer directionality and grey lines representative of downwards transfer,

according to the CPP hierarchy. As shown above, not every possible cross-domain combination occurs in the corpus, and those which occur do it rather heterogeneously and seem to reveal the following tendencies:

- Downwards transfer (contrary to the CPP) is not only more frequent, but also more varied (eight different possibilities) than upwards transfer (four). The latter only occurs when lower senses take the role of source domains: TOUCH and TASTE are the only senses involved as source domains in upwards transfer, which is not surprising since they are at the bottom of the hierarchy. However, all senses and not only those higher in the hierarchy act as source domains in downwards transfers except TOUCH, the lowest sense.

- All senses, except SOUND (present only as source), act both as source and target domains in the corpus, with some peculiarities: SMELL serves only as source when TASTE is the target and vice versa; and higher senses, VISION and SOUND, act as sources for all three lower senses SMELL, TASTE and TOUCH.

These observations suggest that the directionality found in my corpus radically contradicts the CPP due to the fact that sensory modalities may follow a different hierarchy. The results from my corpus are indicative of novel tendencies of synesthetic behavior that depart from the model under study, which led to the re-examination of data to find visible patterns that could answer my third RQ.

4.3. RQ 3: Sensory hierarchy and transfer directionality in OOTN

When looking at the frequency of each type of transfer (Table 1 above), a directionality contrary to the CPP was observed (see Figure 3). In the same way, Figure 4 above shows a meaning transfer flux that seems incompatible with the CPP sensorial hierarchy. This could indicate that

my corpus does not reflect the hierarchy in which the CPP orders sensorial modes, this is, my data seems to show a different ranking of senses. To explore the hierarchy of sensory modes in my corpus, I consider not only the presence but also the frequency of each sense taking either a source or target domain role in the transfers (Figure 5 below):

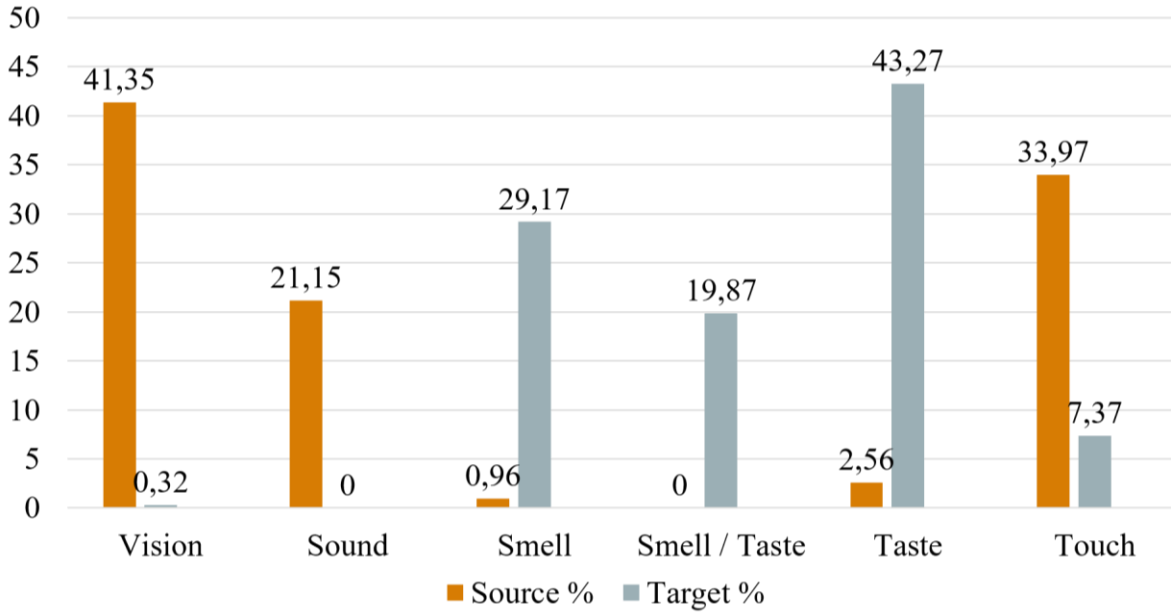

Figure 5. Role of sensorial modes in cross-modal transfers.

Figure 5 shows a clear tendency in the role of senses in synesthetic transfers in OOTN: VISION, SOUND and TOUCH seem to be the source sensorial modes used to talk about those of SMELL and TASTE as targets. Hence, in the discourse community of olive oil tasting, the preferred hierarchy and directionality, if we are to model sense conceptualization as such, appears to be VISION → TOUCH → SOUND → SMELL → TASTE. Taking this hierarchy, the synesthetic metaphors in my corpus would fit an apparent preference principle in which transfers tend to occur from low to higher senses, being upwards transfers (blue in Figure 6) more frequent than downwards (grey):

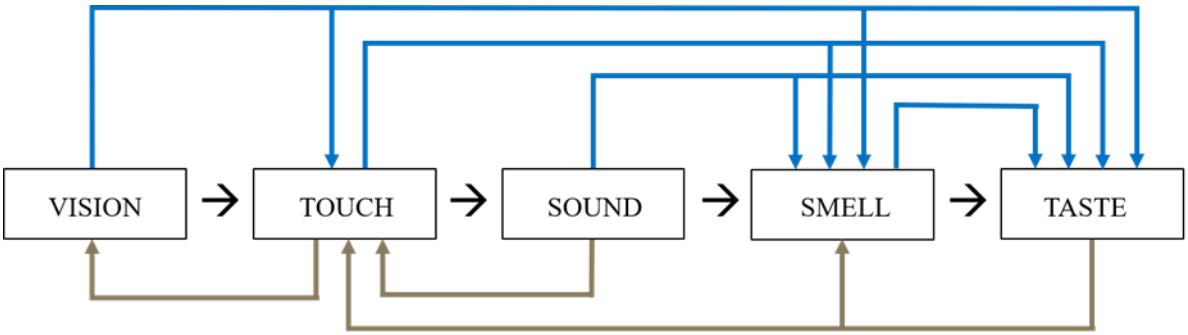

Figure 6. Synesthetic transfer flux taking the hierarchy found in the corpus.

In this hierarchy, all senses take the roles of source and target domain except SOUND, acting only as source, which also happened in the CPP hierarchy. Nonetheless, now only 3.21% of synesthetic expressions (10 out of the 312 total occurrences) follow a downwards transfer of meaning, while 96.79% comply with an upwards directionality. Besides, this ranking goes in line with similar qualitative tendencies intuitively pinpointed in previous studies, such as Suárez-Toste (2017, p. 100) in the wine tasting discourse. The novelty of my results in this sense lies on their quantitative representativeness, since Suárez-Toste (2017) only illustrates these patterns through a few examples, which were indeed reflective of the transfers depicted in Figure 6, but in any way were they quantified and laid down in a hierarchy.

Even if we take hierarchy in Figure 6 as valid in the olive oil tasting discourse, the question of what exactly motivates this particular order of preference in the source and target assignment of senses (my fourth RQ) remains unanswered. Closeness to the perceiver, as proposed by the CPP, needs to be discarded: VISION (remote) is next to TOUCH (direct contact) in the lower end of the hierarchy; and SMELL (remote) follows TASTE (direct contact) in the higher end, sharing nothing about the physical distance needed by a perceiver to receive the stimuli. The existence of specific organs (Shen, 1997) does not explain the hierarchy found in the data either, as TOUCH (with no

specific organ) ranks between VISION and SOUND, both linked to specific organs and located in the bottom half of the hierarchy.

4.4. RQ 4: A cognitive-contextual approach to explain synesthesia in OOTN

To shed light on why my hierarchy does not seem to reflect any consistent motivation for such ranking of sensorial modes, let us revisit Figure 5 above. On the one hand, VISION is the source domain in 41.35% of the synesthetic transfers found, TOUCH is the source in 33.97% of the cases and SOUND in 21.15%. SMELL and TASTE are the source domains in the remaining 3.52%. On the other hand, SMELL and TASTE are the target sensorial modes in 92.31% of synesthetic transfers found. Of the remaining targets, TOUCH takes the most part excluding one instance of VISION being the target domain. From these data, several observations can be made:

1. VISION is the sense most relied on as the source domain to build sensory meaning through synesthetic transfer.

2. SOUND, being the only sense not literally involved in the activity of tasting, is used as source domain in a considerable number of instances of synesthetic metaphor.

3. SMELL and TASTE are the targets of the vast majority of synesthetic expressions found and they tend to be the source for each other when a transfer involves both.

4. TOUCH, despite being the target of some transfers, is the second most used source domain to build synesthetic sensory meaning. The reason why TOUCH is more involved in synesthetic transfers as source rather than target domain cannot be explained within the scope of this work. Results show that 64.16% of the transfers where TOUCH is the source, TASTE is the target, which could point towards a metonymic extension of meaning given

> that both stimuli are perceived physically together in the mouth. In this sense, Suárez-Toste (2017), speaking of synesthetic instances in wine tasting notes, admits that there are aspects of tasting which "overlap with tactile sensation" (2017, p. 91) and that there are "many instances of synesthesia grounded in the confusion around sensory organs" which are nevertheless "perfectly lexicalized" (2017, p. 107).

This behavior could have a twofold explanation: the predominance of sight and hearing in human perception and cognition (Viberg, 1983, 2001); and the rhetorical preferences of the discourse community involved in the olive oil tasting LSP, and, more particularly, in the genre of OOTN (Sanz Valdivieso & López Arroyo, 2020).

To begin with, Viberg (2001, p. 1307) proved the universal dominance of sight and, to a lesser extent, hearing, over the rest of the senses in human perception. This could help explain observations 1. and 2. Regarding the rest of the senses, Viberg (1983) identified a sensorial scale (VISION → SOUND → TOUCH → SMELL/TASTE) which is not restricted to synesthetic transfers of meaning but has a universal character applicable to all semantic extensions of a wide range of typologically different languages. However, Viberg's hierarchy still does not match the one found in the corpus studied in this work, although it is more proximate to it than the one part of the CPP tested above.

At this point, it is necessary to reconsider results in the light of OOTN embodying a specialized sensory discourse and being a LSP genre (Vid Supra section 2). This entails that OOTN show similar features reflective of the context where they are produced, which, in this case, involves a particular way of arranging specific units of information regarding the tasting of an olive oil sample. Sanz Valdivieso & López Arroyo (2020, p. 34) identified the preferred rhetorical

structure in which members of this discourse community organize their sensory perceptions. It was found that 99.50% of the OOTN contained allusion to the TASTE of the sample, 58.60% in the case of SMELL (aroma), 21.71% in that of TOUCH (mouthfeel) and 11.30% in that of VISION (appearance). These data, which may explain observations 3. and 4., show that stimuli perceived through TASTE and SMELL are the most relevant in OOTN, followed by TOUCH and then VISION—an order of preference which does match the hierarchy found in this work. Therefore, and answering my fourth RQ, the motivation of synesthetic metaphors in OOTN appears to be based on universal human cognitive patterns attuned by speakers' in-utterance needs and aims according to the discursive context.

5. Conclusion

This corpus-based study of the olive oil tasting LSP has followed an innovative computer-assisted methodology to identify synesthetic metaphors. These have been collected into an inventory and analyzed in terms of source and target assignment and cross-domain meaning transfer. The aim was to reveal substantial tendencies and propose a possible motivation behind synesthetic creation of sensory meaning.

The identified hierarchy and directionality of meaning transfer in the creation of synesthetic expressions in OOTN challenge the CPP. Physiological factors—closeness to the perceiver or the existence of specific organs—do not seem to be the motivation behind sensorial preference. Instead, VISION → TOUCH → SOUND → SMELL → TASTE is the hierarchy where an upwards directionality of meaning transfer appears to be most likely to happen. These unexpected results may be due, on the one hand, to human perceptive predilection for visual and aural senses (Viberg, 2001); and, on the other, to OOTN devoting greater rhetorical relevance to oil's aroma and taste than to its appearance or texture (Sanz Valdivieso & López Arroyo, 2020). Hence, cognition and context—or the activation of specific conventional frames (Diedrich, 2015, pp. 76-77)— take relevance as possible motivators of synesthetic metaphors.

Universal cognitive constraints combined with contextual factors seem to be the key to account for the behavior of sensory figurative language in a given discourse. This cognitive-contextual approach is what would explain synesthetic language in my corpus. So, at least in sensory-related LSP, we could expect a relative primordial dominance of VISION and SOUND at the basis of the conceptual paradigm, further fine-tuned by discourse requirements to fit the particular context where the samples of language occur. If this were the case, it is unclear what synesthetic

behavior would be like in other discourses related to sensory language where the focus is on VISION or SOUND: would the other senses act as sources, then contradicting Viberg (2001)? Would there not be synesthetic expressions at all because we do not need to understand these senses in terms of others? It could be useful to test these assumptions on different languages and on other LSP discourses devoted to sensory activities (graphic art reviews for VISION, musical critiques for SOUND, perfume descriptions for SMELL, etc.). Like that, we could test whether this cognitive-contextual approach helps explain synesthesia in sensory language in any discourse and genre; or if, in contrast, there are completely unrelated sensorial preferences in other LSP where the human activity involved focuses on different sensorial modes.

Indeed, there are research implications derived from this cognitive-contextual explanation behind synesthetic behavior in OOTN. The former—visual and aural preference in human perception—is invariable but the latter is infinitely variable. However, context can be parameterized for the sake of language study by reducing it to those defining features of a genre: as shown in the present work, the LSP genre's rhetorical structure helps restrict the interpretative frames expected in the utterances under study. Even though methodologies for the study of these phenomena can be improved, the possibility of establishing a sensorial preference universal regarding synesthetic creation of meaning, as attempted by previous models (Ullman, 1945; Shen, 1997; Shen & Gadir, 2009), seems highly unlikely. This also applies to the CMT, where metaphoric transfers of meaning are assumed to follow a SPECIFIC → GENERAL schema (Lakoff & Turner, 1989, p. 162). This does not seem to happen in my findings either, as my hierarchy does not reflect a growing ranking of concreteness, which the CPP hierarchy in fact did. However, the universality of the CMT has also been questioned by scholars: among other problematics, the notion of embodiment as the basis of metaphors has been disproven in favor of "cultural

considerations and cognitive processes of various kinds" (Kövecses, 2005, p. 4). Hence, the failure of the CPP in the prediction of synesthetic behavior could be actually due to the fact that the theory in which it is rooted is not fully universal, after all.

All these issues leave us wondering even whether a lineal unidirectional sensorial preference is the most appropriate or accurate way of conceptualizing this phenomenon. One thing is certain: synesthetic creation of sensory meaning is neither exclusively dependent on external stimuli nor entirely predictable through static linguistic principles. Linguistic expression is modelled by a wide array of factors, often rather extralinguistic, which make language (as text) not revelatory enough to study Language (ability). Instead, our own cognition and the linguistic and heuristic effect of communicative context—human activity involved, genre, discourse community, culture, society—largely determine conceptualization of senses and its linguistic expression (Caballero & Ibarretxe, 2013; Kövecses, 2005; Majid & Levinson, 2011).

In any case, questions undoubtedly outnumber the answers provided by this work. However, several statements can now be asserted in view of the research here presented:

- OOTN are pervaded by cross-sensorial meaning transfers, amounting to a total of 127 different synesthetic expressions, which are a potential contribution to the development of reference tools that aid communication and learning processes in the specialized discourse of olive oil tasting.

- Current theory and technology have proven to be advantageous for linguistic analyses in terms of comprehensiveness, accuracy, objectivity and time investment, but by no means does the employment of automatized software substitute the need for some degree of manual—albeit not intuitive—analysis by the researcher.

- Conceptual preference of sensorial modalities and their behavior in synesthetic metaphor cannot be certainly predicted in terms of frequency nor explained universally by the CPP.

- OOTN show a CPP-contradictory hierarchy of sensory preference (VISION → TOUCH → SOUND → SMELL → TASTE) where there is a substantial tendency for upwards transfer directionality.

- The motivation of source and target domain assignment in synesthetic metaphors in the olive oil tasting LSP is possibly a combination of universal cognitive patterns and communicative context, although it is unclear whether this can be applied to other kinds of sensory-related languages.

- Textual analyses alone will hardly help build models that successfully explain synesthetic behavior, and it is multi-domain approaches (including Linguistics, Anthropology, Sociology and Neuroscience, among other relevant fields) that will provide more complete understanding on the matter.

The olive oil tasting LSP—as part of both of a natural language and of a discourse community with its particular needs and aims, which have been shown to be reflected in its members' use of language—serves to illustrate the ineffability of absolute language universals and the inextricable interdependence of the ability of language, communicative context and language use. More research is needed in sensory language, perception and cognition in relation to different discourse communities, languages and cultures to try to explain how those contextual factors contribute to shape human communication and experience.

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Appendix I

Inventory of synesthetic expressions found in the corpus

Synesthetic expression	Source mode	Target mode	Direction
1. A touch of	Touch	Smell / taste	U
2. A touch of on the nose	Touch	Smell	U
3. Acidic burn	Taste	Touch	D
4. Aroma has tones	Sound	Smell	D
5. Aroma is clean	Vision	Smell	D
6. Aroma is green	Vision	Smell	D
7. Aroma is rotund	Touch	Smell	U
8. Aroma is vibrant	Touch	Smell	U
9. Aroma is well-rounded	Touch	Smell	U
10. Aroma with an undertone	Sound	Smell	D
11. Aroma with tones	Sound	Smell	D
12. Aroma with warm undertones	Touch	Smell	U
13. Aromatic flavour	Smell	Taste	D
14. Bitterness and spiciness are harmonic	Sound	Taste	D
15. Bitterness crescendos	Sound	Taste	D
16. Bouquet embellishes the fruitiness	Vision	Smell	D
17. Bouquet with a touch of	Touch	Smell	U
18. Bright fragrance	Vision	Smell	D
19. Bright fruitiness	Vision	Smell / taste	D
20. Clean finish	Vision	Touch	D
21. Clean flavour	Vision	Taste	D
22. Clean fruitiness	Vision	Smell / taste	D
23. Clean mouthfeel	Vision	Touch	D
24. Clean nose	Vision	Smell	D
25. Clean palate	Vision	Touch	D
26. Clean scents	Vision	Smell	D
27. Clean tasting	Vision	Taste	D
28. Clean texture	Vision	Touch	D
29. Colour with warm hues	Touch	Vision	U
30. Crescendo of flavours	Sound	Taste	D
31. Embellished with notes	Vision	Smell / taste	D
32. Fireworks for your palate	Sound	Touch	D
33. Fireworks for your palate	Vision	Touch	D
34. Flat on the mouth	Touch	Taste	U
35. Flat on the nose	Touch	Smell	U
36. Flavour is green	Vision	Taste	D
37. Flavour is silky	Touch	Taste	U
38. Flavour is smooth	Touch	Taste	U
39. Flavour is vibrant	Touch	Taste	U
40. Flavour with a hint of green	Vision	Taste	D

41. Flavour with a touch of	Touch	Taste	U
42. Flavour with green characteristics	Vision	Taste	D
43. Flavour with heat	Touch	Taste	U
44. Flavour with tones	Sound	Taste	D
45. Flavour with warmth	Touch	Taste	U
46. Floral overtones	Sound	Smell / taste	D
47. Fragrance with bright hints of	Vision	Smell	D
48. Fragrant flavour	Smell	Taste	D
49. Fruity tone	Sound	Smell / taste	D
50. Green aroma	Vision	Smell	D
51. Green entry	Vision	Taste	D
52. Green flavour	Vision	Taste	D
53. Green fruitiness	Vision	Smell / taste	D
54. Green notes	Vision	Smell / taste	D
55. Green notes on the palate	Vision	Taste	D
56. Green scent	Vision	Smell	D
57. Green sensation	Vision	Smell / taste	D
58. Green smell	Vision	Smell	D
59. Harmonic flavour	Sound	Taste	D
60. Harmonious aroma	Sound	Smell	D
61. Harmonious flavour	Sound	Taste	D
62. Harmonious fruitiness	Sound	Smell / taste	D
63. Harmonious mouth	Sound	Taste	D
64. Harmonious nose	Sound	Smell	D
65. Harmonious on the nose	Sound	Smell	D
66. Harmonious on the palate	Sound	Taste	D
67. Harmonious palate	Sound	Taste	D
68. Harmony between bitterness and spice	Sound	Taste	D
69. Harmony of flavour	Sound	Taste	D
70. It shines with notes of arugula	Vision	Smell / taste	D
71. It smells clean	Vision	Smell	D
72. It smells green	Vision	Smell	D
73. It smells sweet	Taste	Smell	U
74. It sparkles in the mouth	Vision	Taste	D
75. It tastes vibrant	Touch	Taste	U
76. Mouth achieves harmony	Sound	Taste	D
77. Mouth is green	Vision	Taste	D
78. Mouth with a touch of	Touch	Taste	U
79. Nose displays green notes	Vision	Smell	D
80. Nose with green characteristics	Vision	Smell	D
81. Palate: clean	Vision	Touch	D
82. Palate has undertones	Sound	Taste	D
83. Palate is harmonious	Sound	Taste	D
84. Palate: sharp notes	Touch	Taste	U
85. Palate with undertones	Sound	Taste	D

86. Pepper tones	Sound	Smell / taste	D
87. Peppery burn	Touch	Taste	U
88. Pungency is harmonic	Sound	Taste	D
89. Pungent and bitter are harmonious	Sound	Taste	D
90. Pungent aroma	Taste	Smell	U
91. Rounded aroma	Touch	Smell	U
92. Rounded flavour	Touch	Taste	U
93. Rotund in the mouth	Touch	Taste	U
94. Sharp aftertaste	Touch	Taste	U
95. Sharp scent	Touch	Smell	U
96. Sharp notes	Touch	Smell / taste	U
97. Smooth flavour	Touch	Taste	U
98. Smooth taste	Touch	Taste	U
99. Soft notes	Touch	Smell / taste	U
100.Soft pungency	Touch	Taste	U
101.Spicy aroma	Taste	Smell	U
102.Sweet aroma	Taste	Smell	U
103.Sweet scent	Taste	Smell	U
104.Sweet texture	Taste	Touch	D
105.Taste balanced by overtones	Sound	Taste	D
106.Taste exhibits harmony	Sound	Taste	D
107.Taste followed by vivid notes	Vision	Taste	D
108.Taste is brilliant	Vision	Taste	D
109.Taste is clean	Vision	Taste	D
110.Taste is green	Vision	Taste	D
111.Taste is rotund	Touch	Taste	U
112.Taste is smooth	Touch	Taste	U
113.Taste starts out rotund	Touch	Taste	U
114.Taste with a hint of green	Vision	Taste	D
115.Taste with a touch of	Touch	Taste	U
116.Taste with harmonious notes	Sound	Taste	D
117.Taste with harmony	Sound	Taste	D
118.Taste with undertones	Sound	Taste	D
119.Undertone	Sound	Smell / taste	D
120.Undertones harmonize with the finish	Sound	Taste	D
121.Undertones harmonize with the finish	Sound	Taste	D
122.Vivid aroma	Vision	Smell	D
123.Vibrant entry of pungency	Touch	Taste	U
124.Vibrant palate	Touch	Taste	U
125.Vibrant smell	Touch	Smell	U
126.Vibrant taste	Touch	Taste	U
127.Warm pungency	Touch	Taste	U