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Gender congruency effect in European Artwork: the perceived femininity of abstract nouns

Relatrice: **Prof.ssa Anne Maass**

Correlatrice: **Dott.ssa Carmen Cervone**

Laureanda: **Ilaria Motta**

Matricola: **1234412**

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Abstract

Gli artefatti culturali (statue, dipinti) fanno parte dell'immaginario collettivo culturale. I concetti astratti vengono spesso rappresentati nelle opere d'arte attraverso l'uso di personificazioni femminili. Le persone sono spesso esposte a molteplici rappresentazioni artistiche di concetti astratti come Libertà, Giustizia, e Innocenza che appaiono nei quadri sotto sembianze di donna. La corrispondenza tra astratto e femminile non è causale, infatti questi concetti condividono il fatto che sono grammaticalmente femminili sia in latino che in greco. Benché la letteratura sugli effetti del genere grammaticale non sia ampia, alcuni studi suggeriscono che il genere assegnato dall'artista alla personificazione nelle opere d'arte possa in parte essere stato influenzato dal genere grammaticale del concetto astratto rappresentato. In altre parole, il genere grammaticale potrebbe essere in grado di influenzare la nostra percezione di mascolinità-femminilità dei concetti astratti non solo in maniera diretta ma anche attraverso gli artefatti culturali che spesso mantengono il genere grammaticale del concetto nella lingua nativa dell'artista. In questa tesi verrà approfondita la relazione tra astratto e femminile e le possibili conseguenze sociali e culturali che possono derivare da questa corrispondenza.

Introduction

Cultural artifacts such as paintings and statues are part of the collective cultural imagination. Many abstract concepts are often represented in artworks by female personifications. Throughout their lifetimes, people are likely to be exposed to numerous female personifications of Justice, Liberty, Innocence, Luck and so on. What all of these concepts have in common is that they carry feminine grammatical gender both in Greek and in Latin, suggesting that languages may affect gendered images at great temporal distance, mediated by cultural artifacts. This correspondence between abstract concepts and femininity is not casual and it originated from the Proto-Indo European language, the common ancestor of Latin and Greek. Although these effects of grammatical gender have rarely been investigated, some studies suggest that the personified gender of abstract concepts may, at least in part, reflect grammatical gender of the concept itself. In other words, grammatical gender may be able to influence our perception of masculinity-femininity of abstract concepts not only through a direct route but also through cultural artifacts which often mirror the grammatical gender of the concept in the native language of the artist. In this thesis, I will try to provide an exhaustive explanation that accounts for the fixed femininity of personified abstractions through centuries and the possible social and cultural consequences deriving from this association between femininity and abstractness.

Chapter 1: Grammatical Gender

The linguistic relativity principle, also known as the Sapir-Worf Hypothesis, proposes that the structure of a language affects its speakers' cognition and thoughts. This linguistic field has been controversially discussed for decades particularly in the influence of grammatical gender, which is claimed to affect how nouns are conceptualized. This chapter is going to address the origin of grammatical gender systems and the link between feminine grammatical gender and abstractness.

1.1 Grammatical Gender and Grammatical Gender Systems

"Grammatical gender refers to an abstract system of noun classes that determines the behavior of associated words such as determiners and adjectives"(Bender et al., 2016, p. 49). Grammatical gender, unlike case and number, is invariable, it is inherent in nouns, and "each noun must necessarily belong to a gender"(Luraghi, 2014, p. 208). It is crucial to note the function of grammatical gender in a language. Grammatical gender is in line with other grammatical categories, and it helps to establish and interpret linguistic relations among words in a sentence (Matasovic, 2004). In other words, grammatical gender markers allow speech participants to track referents more easily.

According to Cameron (1985) and Corbett (1991), languages can be divided into two main categories based on their gender systems that may be semantic or formal (Irmen & Roßberg, 2004). "In semantic gender systems, the gender of noun can only be derived from its meaning, that is, from the sex of its referent […]. Formal systems, by contrast extend gender categories way beyond animate referents to all nouns" (Beller et al., 2015, p. 334). Formal gender systems characterize languages such as French or German whereas gender is arbitrary and widely unrelated to meaning. As a result, the same noun may belong to different gender categories in different languages (Irmen & Roßberg, 2004).

1.2 Origin and evolution of Indo-European grammatical gender systems

The history and the evolution of grammatical gender systems cannot be directly observed, so the reconstruction necessarily remains speculative, but going back in time is

crucial for understanding today's link between feminine grammatical gender and abstractness.

Ancient Indo-European languages such as Greek and Latin, attest to a sex-based three-gender system, which includes masculine, feminine, and neuter. Proto-Indo-European (PIE) is considered the common ancestor of Ancient Indo-European languages and was spoken as a single language during the Late Neolithic up to the Early Bronze Age. It is believed to have developed from a two-gender system, distinguishing animate vs. inanimate, into a three-gender system (Matasovic, 2004; Luraghi, 2011) divided into animate vs. inanimate/abstract or collective vs. inanimate/concrete. The existence of the early two-gender system before PIE was confirmed with the decipherment of the Anatolian language Hittite which brought with it new evidence for the hypothesized animacy-based system. Specifically, Hittite did not distinguish between masculine and feminine; it only had a distinction between animate and inanimate/neuter. Thus, the three-gender system in PIE developed after Anatolian languages had already branched off (Beekes & de Vaan, 2011). Importantly, the PIE three-gender system initially did not have a male/female connotation, as already argued by Brugmann (1891). Similarly, Wheeler (1898) argues that "the form-groups of nouns which mark the classification by gender had originally nothing to do with distinctions of sex. Their distinctive endings did not carry with them originally the suggestion of sex; thus, the so-called 'feminine' suffixes [...] served rather, to form collectives and abstracts" (Wheeler, 1898, p.529). Thus, the feminine suffices initially did not imply any gender meaning at all but referred to collectives and/or abstractness. The feminine gender was a later development of PIE that occurred after the Anatolian branch split from PIE. This feminine ending in "a" comes from the suffix *-(e)h2-, which was derivational in origin but it slowly became a vowel associated with the feminine gender (Luraghi, 2011).

However, how the extension from collective/abstract to feminine came about is still debated (for an overview see Luraghi, 2009). Regardless of how exactly the switch occurred, linguists seem to agree that the suffixes that originally referred to abstractness only subsequently became associated with femininity. If this argument is correct, then it would not be surprising if abstract nouns were predominantly of feminine grammatical gender in those languages that derive from Proto-Indo-European language.

1.3 Grammatical Gender and Abstractness in Indo-European Languages

To investigate the relation between grammatical gender and abstractness in current and ancient Indo-European languages, Cervone and colleagues (2022) analyzed abstract and concrete nouns both in Latin and Italian to test whether feminine grammatical gender was over-represented among abstract nouns and whether this asymmetry held across different (current and ancient) Indo-European languages. To summarize the results, Italian and Latin feminine nouns tend to be more abstract, less imaginable, learned later, less familiar, acquired mostly through language, and less available in the context around. All these characteristics are in line with the higher level of abstractness which makes them more difficult to learn compared to concrete nouns. By contrast, Italian masculine nouns and Latin masculine and neuter nouns tend to behave oppositely, as they tend to be more concrete, more imaginable, learned earlier, more familiar, acquired mostly through direct experience and available in the context. These differences between masculine and feminine genders suggest that, partially, Italian has maintained some traits of the Proto-Indo-European gender system such as feminine/abstract and masculine/concrete categories in the masculine/feminine gender system. Interestingly, as hypothesized by the authors, the effect of Italian grammatical gender is weaker when compared to Latin grammatical gender. Additionally, Latin feminine nouns used to be more predominantly abstract than Italian feminine nouns, showing that the division between feminine/abstract nouns and masculine/concrete nouns was clearer in Latin whereas in Italian this division is less precise. The authors suggested that this happened during the passage from Latin to Italian, as many Latin feminine nouns which represented abstract concepts evolved into Italian masculine nouns. This change influenced the global level of abstractness of the two languages and raised the level of abstractness of Italian masculine nouns. The same process happened for Latin masculine nouns which were transformed in Italian feminine nouns and reduced the level of abstractness. Logically languages are affected by multiple influences such as sociocultural factors, and the abstractness-femininity association was weakened over time.

This study not only confirms the association between feminine nouns and abstractness but supports the linguistic hypothesis that PIE suffixes that originally referred to abstractness only subsequently became associated with femininity.

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Chapter 2: Gender Congruency Effect

Grammatical gender influences perceptions of masculinity and femininity of nouns in formal languages. A gender congruency effect is detected when nouns are perceived as more masculine or more feminine depending on the grammatical gender of the nouns.

For example, whereas English readers rely only on stereotypical information, readers of languages based on a formal gender system might use the grammatical gender of the noun to infer the protagonist's gender (Garnham et al., 2012).

2.1 How Grammatical Gender creeps into perception and beyond

An extensive line of research on the gender congruency effect suggests that grammatical gender may indeed accord psychological meaning to objects and concepts (for overviews see Samuel et al., 2019; Stahlberg et al., 2007). This literature can roughly be organized along three routes through which grammatical gender affects cognition, namely (a) accessibility of gender-congruent exemplars, (b) activation of gender-stereotypes that are projected onto objects and (c) the transmission of gendered images through cultural artifacts.

2.1.1 The influence of grammatical gender through retrieval of information

The first process concerns the fact that grammatical gender determines, to some degree, which exemplars come to mind. In other words, the retrieval of information is channeled by the grammar used to solicit it. For instance, priming studies suggest that same gender nouns become more accessible than opposite gender nouns and that this is due to both a facilitation of the former and an inhibition of the latter (e.g., Bates et al., 1996). The greater accessibility of gender congruent exemplars has tangible social consequences. For instance, when asked to indicate favorite musicians, writers and the like, women are rarely mentioned if the question is posed in generic masculine form that, theoretically, also includes women (Stahlberg et al., 2001). Only when framing the question in dual form (i.e., that combines the masculine and the feminine suffix) will people also mention female exemplars. The common process likely to underline these phenomena is selective retrieval, during which grammatical gender channels the search

for corresponding gender of the exemplar to be retrieved. In other words, masculine grammatical gender (even when intended generically) has a semantic component of maleness that favors gender-congruent retrieval.

2.1.2 The influence of Grammatical Gender through the activation of gender stereotypes

The second process involves the projection of stereotypically masculine or feminine characteristics onto objects, animals, or concepts on the basis of grammatical gender (for an overview see Bender et al., 2016). In these cases, the arbitrary grammatical gender of nouns carries over to the object itself. The two most common ways to illustrate this process is to either ask participants to assign features to the object (feature assignment task) or to choose a male or female voice to represent the object in a cartoon (voice-assignment task). The feature assignment task usually involves a cross-linguistic comparison in which stimulus words are chosen such that the same word is feminine in one and masculine in the other language. An example of the feature assignment task is Konishi's (1993) classical study in which German and Spanish speakers rated words on evaluation, potency, and activity. For words that were grammatically masculine in German but feminine in Spanish, German participants provided higher potency ratings, whereas the opposite was found for those words that were grammatically masculine in Spanish but feminine in German. This suggests that people envisage objects to have stereotypically feminine or masculine characteristics in line with the grammatical gender of the words that describe them. However, overall evidence based on the feature generation task is mixed and the projection of grammatical onto semantic gender appears particularly weak in languages with more than two genders (such as German, e.g., Vigliocco et al., 2005). Gender congruency emerges more clearly in studies using the voice-assignment task. Here, participants are told that their opinion is needed for the development of a cartoon in which common objects come to life. The participant's task is to indicate whether a male or female voice is better suited to represent that particular object in the cartoon (e.g., Sera et al., 1994, Exp. 2). In languages with grammatical gender, voice assignment is greatly influenced by the gender of the word (for a review see Bender et al., 2016), although grammatical gender is not the only basis on which male vs. female images are formed. For instance, in languages with and without grammatical

gender, people tend to associate artifacts (such as spoon, book) with males and natural elements (such as apple, fish) with females (e.g., Mullen, 1990; Sera et al., 1994). Thus, although grammatical gender is certainly not the only variable at play, it does spread to semantically gender-free objects. Together, both paradigms (feature assignment task and voice assignment task) provide evidence that grammatical gender of words generalizes to the objects they describe, but findings are stronger and more reliable for the latter. This difference may, in part, be explained by the fact that the voice-assignment task only requires that the object be associated with one of two genders (male or female), whereas the feature assignment task requires a two-step process in which people not only associate the object with a specific gender, but also apply stereotypical features on that basis.

2.1.3 The influence of Grammatical Gender through Cultural Artifacts

Cultural artifacts such as paintings and sculptures fulfill exactly this function and constitute the third route through which grammatical gender may transmute into gender-congruent mental representations. For instance, liberty is feminine in numerous grammatical gender languages, including Latin, Italian, French, German, Spanish, ancient and modern Greek, and Polish, and it is usually also represented as a woman. Thus, the third route through which grammatical gender can affect our cognition and imagination are cultural artifacts informed by grammatical gender. What makes this pathway different from the other, more immediate ones, is the fact that it is cumulative and operates over extended time periods. Cultural artifacts such as statues or paintings may date back centuries and may have been influenced by languages that are no longer in use. Still, these gendered artifacts remain part of the collective imagination of the concepts they embody. Take the example of Plato's four cardinal virtues, namely wisdom, temperance, courage, and justice. Regardless of whether they speak languages with or without grammatical gender, we suggest that people in Western countries tend to envisage these highly abstract concepts as feminine. Throughout their lifetimes, people are likely to be exposed to numerous female personifications of Justice, from representations of the Greek goddess Dike, up to the numerous representations of blindfolded Lady Justice. Similarly, sculptures of Liberty tend to be female as in the case of Libertas, the Roman goddess of Liberty, and the Statue of Liberty in NYC. What all these concepts have in common is that they carry feminine grammatical gender both in Greek and in Latin, suggesting that

languages may affect gendered images at great temporal distance, mediated by cultural artifacts. Although these effects of grammatical gender have rarely be investigated, a few studies suggest that personified gender of abstract concepts may, at least in part, reflect grammatical gender.

2.2 Gender Congruency Effect in Art: The personified gender of abstract concepts

To our knowledge, most prior studies have investigated gendered images related to concrete nouns such as animals, plants, and artifacts. Thus, it remains unclear whether the gender congruence effect also occurs for abstract concepts.

Segel and Boroditsky (2011) found that in the arts, grammatical gender predicts the gender of the personification of abstract concepts well above chance, showing that the gender of the portrayal coincided with the grammatical gender 78% of the time, suggesting that grammar determines artistic expression to some degree.

Interestingly, both Beller et al.'s (2015) research, conducted in Norwegian language, and Bender, Beller, and Klauer's (2016b) research, conducted in German language, showed strong gender congruency effects for abstract nouns for which grammatical gender and personified allegorical depictions coincide but not for nouns in which grammatical gender and allegorical depictions clash. Examples of the latter category are peace and spring which are grammatically masculine, or honor, which is grammatically feminine in Norwegian and German. In these cases, in both sets of studies, the allegorical gender generally wins over grammatical gender. However, this does not preclude the possibility that, historically, allegorical gender may have been influenced by grammatical gender of ancient languages. For instance, although peace is masculine in current Norwegian and German, it is grammatically feminine both in Latin (pax) and in Ancient Greek (ἰρήνη). Similarly, Spring is grammatically masculine in Norwegian and German, but feminine in ancient Greek (πηγή). Given that allegorical representations (e.g., sculptures) often date back to Classical, Hellenistic or Roman times, it is not implausible that personification of these abstract concepts followed, at least to some degree, grammatical gender. It is therefore possible that current gendered images of abstract concepts reflect, in part, the original grammatical gender of abstract nouns in ancient languages, mediated by cultural artifacts such as paintings and sculptures.

However, how strong the direct language vs. the indirect cultural effect is on (social) cognition is still debated (Beller et al., 2015; Bender et al., 2018; Samuel et al., 2019). Moreover, with the exception of personified allegorical concepts, relatively little is known about the gender congruency effect for abstract concepts.

2.2.1 Personification-allegory: Definition and theory of personification's gender

In this thesis, the concept of personification-allegory is crucial since cultural artifacts often represent abstract concepts through the use of this rhetorical figure.

"Personification is the rhetorical figure by which something not human is given a human identity or 'face'" (Melion & Ramakers, 2016, p. 1). The term "not human" includes inanimate objects but also abstract concepts, as a very general definition, a personification is the animate figure thereby created (Bloomfield, 1963).

The earliest Western writings such as the Bible or Homer, already contain the figure of personification which can be found throughout all Greek and Roman literature. However, as far as the West is concerned, Medieval times and Renaissance, were the great era of personification allegory in European literature and art (Bloomfield, 1963). Throughout the Medieval Times, the Church constantly stimulated imagination with both symbols and abstractions with the intent of creating a new way to communicate with the audience. Personification-allegories did not require an interpretation or mask a hidden meaning per se, the allegorical meaning was held in the action (Frank, 1953). This concept was captured by Camp (1942) who stated, "A personification is allegoric by its action and not because it represents something different from itself; It is the action which carries the secondary meaning" (p. 42). Personifications of abstract concepts were not symbols but they were literal, so the audience had only to translate the relationships and the actions.

For example, if the allegorist said Drunkenness lured Reason into a pub, inebriated him with drinks, and persuaded him to eat a tart called Sensuality, the actions were not to be taken literally. What the allegorist really meant was that drunkenness may corrupt man's reason and lead to sensuality (Frank, 1953).

There is still an open debate on the fact that classical and medieval personifications were predominantly female. All who have studied medieval personifications have sooner or later wondered about this gendered situation, one of the current theories suggests that grammatical gender may have played a role (Paxson, 1998). In other words, because most

Latin or Greek abstract nouns carry the feminine gender, grammar may have influenced the gender assignment to personifications (Paxson, 1998). This theory would be in line with our linguistic hypothesis which explain the correspondence between femininity and abstractedness in Indo-European Languages.

2.2.2 Women in art history: Gender tropes and the Madonna/whore dichotomy

So far, we focused mainly on the possible influence of grammatical gender on the gendered depiction of abstract nouns, and we have seen how people in Western countries tend to envisage these highly abstract concepts as feminine and portray them as women. Assuming that abstract nouns are predominantly feminine in most Indo-European languages and that people do indeed associate femininity to abstractness, then one important question concerns the consequences that may derive from this association. In other words, how does this association affect women and their portrayal in the cultural collective imagination?

Before tackling the issue, it is important to firstly address the representation of women in art history to understand the role of portrayed women in artworks, especially when they are incarnating abstract concepts.

Two themes that are recurring in the research of femininity within art history, are the female aspect trope and the grouped female trope which both share the depiction of women as tropes (Thompson, 2015). As a matter of fact, women are rarely portrayed as individuals; rather they are used as representational objects. Goddesses, graces, and divines are all incarnations of the female aspect trope which presents women as one dimensional and characterized by a singular trait (Thompson, 2015). The grouped female trope refers to groups of females who are merely placed together in artworks and is often paired with the female aspect trope (Thompson, 2015). Graces, virtues, and vices are all examples of this trope. In Raphael's Three Graces, the three women symbolize the graces charm, beauty, and creativity; however, it is as a group, rather than individuals, that they hold meaning and represent the three aspects (Thompson, 2015). The main consequence of these tropes is that women are stripped of their personhood and seen as representational objects.

Another theme that emerges in the research of femininity in art is the expression/manifestation of the virgin/whore dichotomy. Historically, attitudes towards women tend to be greatly polarized. We suggest that the traditional divide between whore and saint can be traced back to Greek and Roman times by the contrast between the figure of Aphrodite, goddess of love, sex, and beauty, and Athena, goddess of reason and wisdom. This dichotomy was then largely reinforced throughout the Medieval Times by the gradual establishment of the power of the Christian Church which supported misogynist attitudes towards women hidden behind the theological argument (Broude & Garrard, 2018). One example is the dichotomy between Eve and Mary. Kraus (2018) clearly showed the controlling use of artistic images made by the Church that reflected on one hand the identification of women with evil and vice and on the other hand with purity and morality. In other words, in direct contrast to the fallen Eve, symbol of evil, there was the pure and saintly Virgin Mary who redeemed Eve's sins. However, the prototypical concepts of both Eve and Mary were equally extreme and inhuman, unrepresentative of, and inaccessible to living women (Kraus, 2018).

These gendered artifacts remain part of the collective imagination of the concepts they embody, and they are still able to influence the cultural and social perception of women.

2.2.3 Dehumanization and Super-humanization

As outlined in the previous paragraph, women are surrounded by cultural ideals of femininity which are perpetuated through visual arts and the media. Literature, mythology and religion are filled with alienating images of femininity (Ellis, 1989). As we reported before, traditional painting in the West has relied on the female model and transformed her into Virgin, Venus, and Whore (Ellis, 1989). These ambivalent representations of women in the arts over the centuries mirror the social polarized view of women which is typical, but not limited, of sexist men (Glick et al., 1997). This polarization is sustained by subtyping, that is by dividing the female universe into those to be put on a pedestal and those equated to objects or subhuman beings (Glick & Fiske, 2001). The process of subtyping may strengthen the overall stereotype because, as the number of subtypes within it increases, any behavior performed by a member of the group

can be fitted to at least one subtype and thereby pose no challenge to the preexisting belief structure (Richards & Hewstone, 2001).

The question that logically raises is the following: "Do women benefit from the cultural representation of them incarnating abstract concepts or is still another reinforcement to the stereotype subtype which sees women on a pedestal?

Over the past decades, social-psychological research has paid much attention to women objectification and dehumanization through the association with either animals or objects. By contrast little is known about the super-humanization of women. Objectification and dehumanization are phenomena in which people are perceived in ways that are fundamentally inaccurate (Gervais et al., 2013). When we objectify, for example, we treat "as an object what is really not an object, what is, in fact, a human being" (Nussbaum, 1999, p. 218). Dehumanization involves a similar disregard for reality, in which we see and treat people not as human (Gervais et al., 2013). Even though, no literature to our knowledge has yet explored this field, the super-humanization of women could be regard as a form of dehumanization in which women are portrayed as somehow not human. In fact, dehumanization also emerges in more subtle ways, with people seeing or treating others as not completely human (Haslam, 2006; Leyens et al., 2003). The process of super-humanizing women could be a form of positive dehumanization. In contrast to negative dehumanization, positive dehumanization occurs when humans are referred to with non-human language to highlight positive characteristics (Utych & Fowler, 2022). Positive dehumanization has been mainly studied on sports and on work settings. Athletes are often described in mythical, super-human terms by commentators (Hyland, 2014), for example the term "beast" is frequently used to praise elite athletes (Beasley et al., 2014) but that can still dehumanize them even though they are being praised (Morgan, 1992).

Individuals dehumanized in a positive way may be seen as super-human, rather than the typical "less than human" views that dehumanization usually causes, but they are still viewed as not human which plays on the same cognitive biases as negative dehumanization. Utych and Fowler (2022) showed that praising an employee as more than human in some ways also signals that this person is less than human in other ways. Consequently, positive dehumanization leads employees to be evaluated more harshly on

personal traits such as warmth or social skills since these traits are closely associated with humans.

Portraying women as Goddess or super-human creatures not only may reinforce a stereotype subtype which sees women on a pedestal but could also interfere with how women are perceived in the society and reinforce the idea of perfect woman which is not completely human. However, since no literature has yet explored the social consequences of the association between femininity and abstractedness, these reflections remain merely speculative.

In conclusion, since this polarized view of women as super-human or sub-human has remained prevalent in the artistic fields throughout most centuries, we therefore hypothesized that grammatically feminine abstract nouns were going to be perceived as more negative or positive in terms of valence in contrast with grammatically masculine nouns which were going to be perceived more neutral.

2.3 Aims and Hypothesis

This thesis comprehends two studies: The first study is inspired by Segel and Borodistky's study (2011) and investigates the gender congruency effect in European Artworks while taking in account the cultural effect. Moreover, we concentrated only on abstract nouns which are often represented as human figures throughout art history. The hypotheses were the following:

1. Grammatical gender of the abstract concepts in the artists' native language will predict the gender of personification well above chance.
2. Abstract nouns carrying the masculine grammatical gender are going to be perceived as more masculine when a male personification is linked to them and abstract nouns carrying the feminine grammatical gender are going to be perceived as more feminine when a female personification is linked to them.
3. In the cases where the grammatical gender does not predict the gender of the personification, a significant effect of culture will be present (e.g., specific personification of the concept → Solomon's Wisdom).
4. Grammatically feminine nouns will be more likely associated with a generic personification (anonymous person) while grammatically masculine nouns will

be more likely associated with a specific personification (cultural-historical figure).

The second study investigates the possible psychological consequences of formal gender system which may alter the perception and mental representation of nouns. Generalizing from the gender congruency effect observed on concrete nouns, we suspect that the grammatical gender system will alter the perception and mental representation of nouns, such that grammatically masculine nouns be perceived as more masculine and feminine nouns as more feminine. Therefore, abstract nouns should be assigned more feminine characteristics due to the simple fact that a majority of them carry feminine grammatical gender. We also explored the potential contribution of cultural artifacts to this effect. In this study we therefore investigated whether grammatical gender does affect gendered images of abstract concepts and to which degree cultural artifacts contribute to the abstractness-femininity association. The hypotheses were the following:

1. Grammatically masculine nouns will be perceived as more masculine and grammatically feminine nouns as more feminine in line with a gender congruency effect registered in the literature.
2. The gender congruency effect will be stronger when the concept is linked to a gender congruent cultural artifact.
3. Grammatically feminine nouns will be perceived as more negative or positive in terms of valence in contrast with grammatically masculine nouns which will be perceived more neutral in line with the literature.
4. Participants will show a tendency to assign a gender congruent title to the paintings, moreover the tendency will be stronger when the personification is also specific.

Chapter 3: The Artworks Archival Study

The aim of our first study was to investigate whether, in line with Segel and Borodistky's study (2011), grammatical gender predicted the gender of the personified abstract concepts in the arts well above chance. Furthermore, we also hypothesized that abstract nouns would be perceived as more masculine or feminine when a cultural artifact, in line with the grammatical gender, was linked to them (e.g., liberty). However, in the absence of cultural artifacts we hypothesized that the perception of masculinity-femininity of the abstract nouns would be driven only by the grammatical gender of the noun.

3.1 Method and procedure

For this study, we used the ARTstor database (*Artstor*, 2021) , a digital library of more than one million images. We restricted our research to artworks from Europe (Italy, France, Germany, Belgium, Netherlands, and Spain) and classified as prints, paintings, sculptures and installations, drawings, and watercolors. The total artwork collection that matched these criteria was of 408,283 artworks.

Alongside, we selected 93 abstract nouns (Abstractness ≥ 500) from Della Rosa's Database (2010) and one by one we searched, through the ARTstor database, artworks containing personification or allegories of the 93 abstract nouns. The total artworks analyzed were 10,185. We excluded artworks where the personification-allegory was unclear (the title or image did not clearly designate a personification, the depiction was non-human, the gender of the personification was unclear, or the personification was in form of a mixed gender group). Hence, we identified 242 clear personifications, namely each could be clearly classified as a female or male depiction (191 female personifications and 51 male personifications).

From the initial 93 abstract nouns which were searched through the ARTstor Database, 63 abstract nouns did not have any personification linked to them while the other 30 abstract nouns had at least one personification connected to them (14 only females, 6 only male and 10 both).

3.1.1 Construction of the dataset

For the analysis we created a new dataset which included Della Rosa's abstract nouns (Abstractness ≥ 500) and variables already present in Della Rosa's dataset such as concreteness, imaginability context acquisition, age of acquisition, familiarity, mode of acquisition. In Della Rosa and colleagues' (2010) ratings for these variables were obtained from a sample of 250 university students. The scales ranged from 1 to 7 in which 1 indicated highly abstract, difficult to image, unfamiliar, difficult to think of a context, less abstract, and completely acquired through experience and 7 indicated highly concrete, easy to image, familiar, easy to think of a context, more abstract, and totally acquired through language. Responses for all participants were coded and merged into a database, and values for each word on each of the 7 dimensions was multiplied by 100 to produce a range from 100 to 700 (Coltheart, 1981).

Other variables were extracted and added from Cervone et al. (2022), such as Italian grammatical gender, Latin grammatical gender, and mean ratings of masculinity-femininity's perception by 12 raters.

- Italian grammatical gender: This variable indicated the grammatical gender of each noun in Italian. Nouns were categorized as grammatically masculine (0=masculine), grammatically feminine (1=feminine), or ambiguous/dual (2=ambiguous) when nouns could carry both genders or changed gender from singular to plural.

- Latin grammatical gender: This variable indicated the grammatical gender of each noun in Latin. Nouns were categorized as grammatically masculine (0=masculine), grammatically feminine (1=feminine), and neuter (2=neuter).

- Mean ratings of masculinity-femininity: 12 raters indicated on a slider from 0 to 100 how much they considered the concept as feminine, or masculine based on their first impression, evoked association, or mental image. The mean perception of masculinity-femininity was then calculated for all nouns.

Finally, these following new variables were added to the dataset for the aims of the present study:

- Total number of results: Total number of artworks generated by ARTstor for each of the 93 abstract nouns.

- Total number of personifications identified: Total number of artworks containing a clear personification of the abstract concept.
- Gender of the personification: Gender (male=0; female=1) of the personification in the artworks.
- Native language of the artist (only if a personification was present)
- Grammatical gender of the abstract noun in the native language of the artist (0=masculine; 1=feminine; 2=neuter)
- Gender congruency index: Index of congruency between the grammatical gender of the abstract noun in the native language of the artist and the gender of the personification, namely if grammatical gender and gender of the personification were both female or both male (0=incongruency; 1=congruency)
- Generic-specific personification index: This index showed if the personification in the artworks was generic (Generic=0; e.g., anonymous man/woman) or specific (Specific=1; e.g., well-known cultural-historical figure such as Solomon, Hercules, St. Thomas).

3.2 Results

As outlined before, 242 clear personifications were selected from the ARTstor database (191 female personifications and 51 male personifications). Of these, 16 personifications were excluded from the analyses: 7 for which the native language of the artist was English and 9 for which we were not able to find the native grammatical gender of the abstract noun (Flemish-Dutch). Additionally, of the initial 93 abstract nouns only 30 had at least one personification connected to them (14 only females, 6 only male and 10 both) while 63 nouns did not have any personification linked to them.

3.2.1 Artistic choices as a function of grammatical gender

Artists may be influenced by grammatical gender as suggested by Segel and Boroditsky (2011). We therefore analyzed how often personifications in artwork were congruent (vs. incongruent) with the grammatical gender of the concept in the artist's (likely) native language (see Hyp. 1).

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A chi-square test of independence was performed and the relation between grammatical gender and gender of the personification was confirmed as significant, χ^2 (2, $N = 226) = 24.62$, $p < .001$.

Interestingly, the gender congruency effect was much stronger for grammatically feminine than grammatically masculine abstract nouns. The large majority of artists (85%) transformed grammatically feminine concepts into corresponding female ($n = 166$) rather than male ($n = 30$) personifications, binomial (n = 196), $p < .001$. In contrast, grammatically masculine and neuter concepts were similarly likely to be represented as male ($n = 16$) or female ($n = 14$), binomial (n = 30), $p = .860$ (see Figure 1).
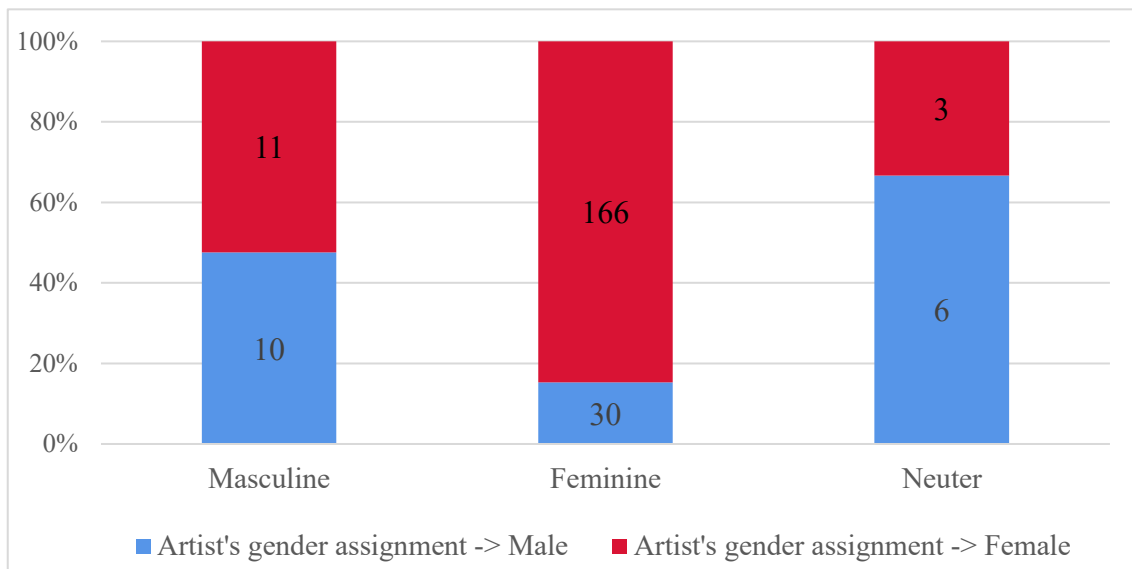
Figure 1: Gender congruency effect in artworks

We also predicted that gender-incongruent personifications would be more likely to refer to specific and identifiable protagonists, whereas congruent ones would be more generic (see Hyp. 3 and Hyp. 4). Confirming these hypotheses, we found that congruent representations were mostly generic (95%), binomial (n = 168): $p < .001$. In contrast, 61% of the incongruent representations were specific, binomial (n = 168): $p < .001$ (see Figure 2).
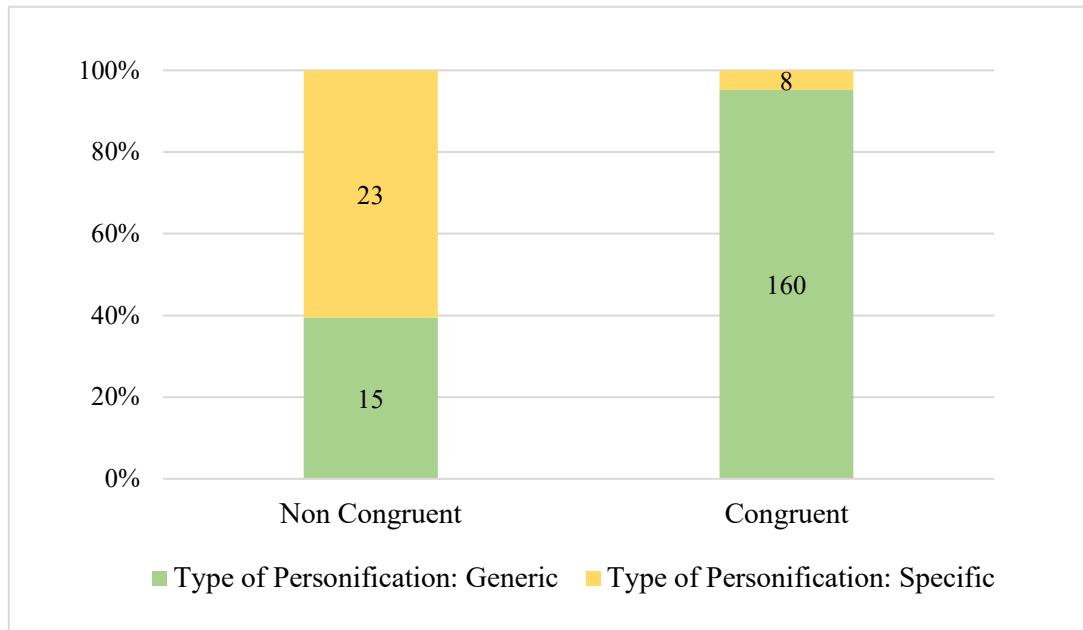
Figure 2: Relationship between type and gender-congruent/incongruent personifications

3.2.2 Perceived femininity as a function of gendered personification in the arts

Does perceived femininity of the concepts (presented as nouns) correspond to their gendered representations of abstract concepts in the arts? (see Hyp. 2). Confirming this hypothesis, the greater the percentage of female personifications in artwork referring to a given concept, the more feminine the concept was perceived by independent raters who only judged the nouns without having been exposed to the personifications, r (30) = .483, p = .007. This suggests a relation between gendered artistic representations and gendered perception of the concept, but it cannot provide information as to the relative weight of gendered arts and grammatical gender. People's gendered perceptions of abstract concepts may be influenced by both gendered personifications in the arts and by grammatical gender of the concept itself.

3.2.3 Perceived femininity as a function of gendered personification and grammatical gender in Romance languages

In an attempt to estimate the relative weight of grammatical gender and gendered personification in the arts, we tried to disentangle grammatical gender and the cultural factor by splitting abstract nouns into two categories: presence of gender-congruent personifications (N = 19) and absence of gender-congruent personifications (N = 66). We hypothesized that the first ones would be perceived as more masculine/feminine than the

latter ones, in line with grammatical gender, due to the presence of at least one congruent cultural artifact linked to the nouns.

A 2 (presence vs. absence of gender-congruent personifications) x 2 (masculine vs feminine grammatical gender) ANOVA revealed a strong effect of grammatical gender, $F(1,81) = 38.22, p < .001, \eta^2_p = .32$, showing that grammatically feminine concepts were perceived as more feminine ($M = 53.34$; $SD = 8.50$) than grammatically masculine concepts ($M = 41.33$; $SD = 6.95$) regardless of the presence/absence of congruent artworks. More interesting, an interaction between the two variables, $F(1,81) = 4.20$, $p = .044$, $\eta^2_p = .05$, showed that the grammatical gender difference was even more pronounced in the presence of gender-congruent personifications (Figure 3).
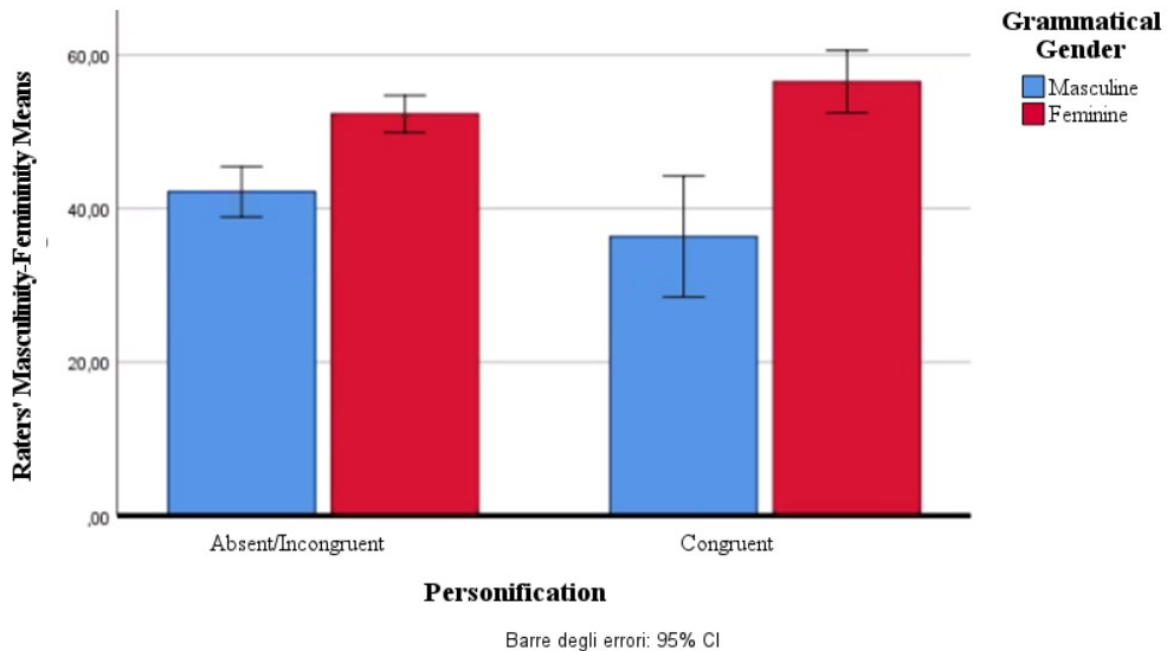
Figure 3: Raters' perception of masculinity-femininity in function of grammatical gender and congruent-gendered personifications

3.3 Discussion

Different conclusions can be drawn from the analysis of 30 randomly selected abstract concepts and their representation in the arts. First, replicating Segel and Boroditsky's (2011) work, artist over-proportionally chose personifications of abstract concepts in line with grammatical gender. This was particularly evident for grammatically feminine nouns, which were depicted as female figures by artists 85% of the time.

Interestingly, this pattern was not confirmed for grammatically masculine and neuters concepts which were similarly likely to be represented as female or male. This difference between grammatically feminine and masculine nouns can be partially explained by the over-proportional presence of grammatically feminine nouns (N = 196) in the abstract category which reflects the association between abstractness and femininity deriving from Proto-Indo European. It may be possible that the gender congruency effect in grammatically masculine nouns was not detected due to the low presence of masculine nouns in the abstract category (N = 21).

Second, our findings suggest a relation between gendered artistic representations and gendered perception of the concept (see Hyp.2), which, however, seems driven to a large extent by grammatical gender. Grammatical gender seems to influence the perception of masculinity-femininity of the concepts independently from the presence/absence of congruent cultural artifacts. Furthermore, congruent cultural artifacts interact with the grammatical gender by enhancing the perception of masculinity-femininity of the abstract concept in line with the grammatical gender.

We also predicted that gender-incongruent personifications would be more likely to refer to specific and identifiable protagonists, whereas congruent ones would be more generic (see Hyp. 3 and Hyp. 4). Confirming these hypotheses, we found that congruent representations were mostly generic (95%) and 61% of incongruent representations were specific suggesting a possible role of culture throughout history in the assignment of incongruent-gender personifications to abstract concepts. It is interesting to note that most gender-congruent personifications were represented by grammatically feminine nouns which again outnumbered the grammatically masculine nouns. Therefore, an association emerges between grammatically feminine abstract concepts and their representation as anonymous women. As reported in the literature, in art history, women are rarely portrayed as individuals and are generally reduced to singular traits by stripping them of their personhood (Thompson, 2015). This result is in line with the female aspect trope which is a recurrent theme in artworks portraying women.

This archival study supports many of our initial hypotheses, however, we initially predicted the presence of a cultural influence in the scenario of gender-incongruent personifications which was not completely detected in the analyses. As reported before, incongruent representations tend to be linked to identifiable protagonists. However,

regarding the perception of masculinity-femininity, the cultural influence was only detected in gender-congruent personifications, where it enhanced the perception of masculinity-femininity in line with grammatical gender of the noun. In the presence of gender-incongruent personifications, the gender congruency effect was still detected, and abstract nouns were perceived as masculine or feminine in line with the grammatical gender independently from the presence of gender-incongruent personifications linked to the nouns. To be fair, our dataset contained only 38 gender-incongruent personifications which may explain why no cultural influence was detected.

Additionally, it is possible that the format of the task of evaluation of masculinity-femininity used by Cervone and colleagues (2022) hindered the cultural influence. Moreover, participants were asked to evaluate concepts based on the first impressions without spending too much time on each noun. Consequently, the instructions of the test may have hindered the cultural influence especially if the association between the abstract concepts and the corresponding gender-incongruent personification was not already strong in the participants' minds and easy to retrieve.

Chapter 4: The Artwork Survey Study

The second study investigated the possible psychological consequences of the gender congruency effect which may alter the perception and mental representation of nouns. Generalizing from the gender congruency effect observed on concrete nouns where grammatically masculine nouns are perceived as more masculine and grammatically feminine nouns as more feminine, we suspected that abstract nouns would be perceived as more feminine since most of them carry feminine grammatical gender (Hyp. 1). We also hypothesized that the gender congruency effect would be stronger when a cultural artifact was linked to the concept (Hyp. 2).

We also aimed to explore the social consequences that may derive from the abstractness-femininity association by investigating the perception of abstract nouns in terms of valence (positivity-negativity). We suggested that on one hand, grammatically feminine abstract nouns would be perceived as more positive or negative in line with the polarized attitude towards women which emerged through cultural artifacts and on the other hand grammatically masculine nouns would be perceived as more neutral in terms of valence (Hyp. 3).

Finally, we also asked participants to match titles to artworks that contained a gendered personification. In the archival artwork study, a strong gender-congruency effect emerged in the artists' choice to represent abstract concepts as female figures in line with the grammatical gender. Since the possible influence of grammatical gender on the artist's choice to assign a gendered-congruent personification remains speculative, we tried to replicate a similar process in participants expecting them to match the artworks with grammatically gender-congruent titles, in line with the gender congruency effect. In other words, participants were asked to name the abstract concept depicted in the artworks between two possible options, one was the actual abstract concept portrayed by the artist and the other was a synonym belonging to the opposite grammatical gender category (e.g., sorte, feminine; - destino, masculine). We expected participants to maintain the gender congruency effect in the gender-congruent personifications and to restore the gender-congruency effect in gender-incongruent personifications where the grammatical gender of the original title did not match the personification's gender (Hyp. 4).

To test this latter hypothesis, we firstly had to run a pre-test to ensure that the artworks selected and the corresponding titles to match were balanced in terms of word frequency and to explore the criteria used by participants throughout the task.

4.1. Pre-test Reverse gender congruency effect in artworks

4.1.1 Stimuli selection

From the initial list of 93 abstract nouns used in the archival study, 30 had at least one personification linked to them. We used the following procedure to decide which artworks and corresponding abstract concepts were going to be included in the pre-test as stimuli.

Firstly, we divided the 30 abstract nouns according to the grammatical gender resulting in 9 masculine nouns and 21 feminine nouns. Subsequently, every abstract concept was matched with an opposite gender synonym (OGS), namely a synonym belonging to the opposite grammatical gender category of the original concept (e.g., Sorte - Destino), identified by Cervone and colleagues (2022). We were able to retrieve an OGS for all grammatically masculine nouns, but only 8 OGS for the grammatically feminine nouns. Next, we selected the artwork linked to the abstract concept. Of the initial masculine nouns, three were excluded due to the fact that the personifications linked to the concept were grammatically neuter in the artist's native language and/or they only had one personification linked to them. All the 6 remaining masculine concepts had more than one artwork linked to them (by different artists), some had only congruent personifications ("onore", "disprezzo"), some others had only incongruent personifications ("destino", "inganno") while the other two had mixed gender personifications linked to them ("sospetto", "merito"). Since "sospetto" had mostly incongruent-gender personifications and "merito" had mostly gender-congruent personifications, we balanced the artworks by adding "sospetto" to the incongruent-gender artworks and "merito" to the congruent-gender artworks. Finally, to choose the artwork that was going to be shown to the participants we gave priority to paintings containing only the abstract concept and when this was not the case, we selected the artwork containing less figures.

Since only 6 masculine nouns satisfied all the criteria, we selected only 6 of the initial 8 grammatically feminine nouns. Of these, three concepts contained gender-

incongruent personifications ("intemperanza", incredulità", "colpa"). To select instead which feminine concept was going to be selected for the gender-congruent group, we excluded "immortalità" as it had very few representations and all from the same artist and "logica" as it had very old and low-quality representations compared to the other concepts. The 6 final feminine concepts were "intemperanza", incredulità", "colpa", to represent the gender-incongruent group and "innocenza", "ragione", "saggezza" to represent the gender congruent group. Again, to choose the artwork that was going to be shown to the participants we gave priority to paintings containing only the abstract concept and when this was not the case, we chose the artwork containing less figures.

To briefly summarize, we had 12 artworks of which 6 contained a gender congruent personification in line with the grammatical gender of the original concept (3 MM; 3 FF) and 6 contained a gender-incongruent personification (3 MF; 3FM). Each artwork had two possible "titles" linked to it, one was the original one and the other one was an OGS (see table 1).

Table 1. Selection of abstract concepts, OGS, and corresponding artworks

Artwork original title	Grammatical gender (GG) original title	OGS	Personification's gender	Congruency between GG and Personification's gender
Colpa	Feminine	Sbaglio	Man	No
Incredulità	Feminine	Scetticismo	Man	No
Intemperanza	Feminine	Squilibrio	Man	No
Innocenza	Feminine	Candore	Woman	Yes
Ragione	Feminine	Intelletto	Woman	Yes
Saggezza	Feminine	Sennò	Woman	Yes
Onore	Masculine	Rispettabilità	Man	Yes
Disprezzo	Masculine	Avversione	Man	Yes
Merito	Masculine	Virtù	Man	Yes
Destino	Masculine	Sorte	Woman	No
Inganno	Masculine	Bugia	Woman	No
Sospetto	Masculine	Diffidenza	Woman	No

As reported earlier, we expected participants to maintain the gender congruency effect in the gender-congruent personifications and to restore the gender-congruency effect in gender-incongruent personifications where the grammatical gender of the original title did not match the personification's gender.

The main goal of this pre-test was to test if the pairs of concepts (original and OGS) were balanced and to verify that no biases or unwanted effects emerged and interfered during the task. Particularly, we wanted to ensure that participants were not affected by word frequency since some words were unusual or unfamiliar. In other words, our main concern was that word frequency could play a role in the assignment of the abstract concept to the artwork. On one hand concepts with lower frequencies could be picked due to the solemnity they display, or on the other hand they could be not taken in consideration when compared to a more familiar concept.

Since we hypothesized that the word frequency of the words could play a role in the assignment of one title over the other, we extracted the raw word frequency for each abstract concept and OGS from "CORIS" (UniBO, 2001), a dataset which among other variables also contains the word-frequency across written Italian. CORIS is a dataset designed by UNIBO in 2001 which includes 298,500,000 books and more than 3 million magazines/journals/newspapers. The raw word frequencies were used later in the analysis to ensure that the title's choice made by participants was not influenced by the familiarity/unfamiliarity of the words. In table 2, the raw frequencies of each word are reported.

Table 2. Raw word frequencies of 12 pair of concepts

Original Concept	Raw Frequency	OGS	Raw Frequency
Colpa	9983	Sbaglio	1229
Incredulità	416	Scetticismo	866
Intemperanza	48	Squilibrio	578
Onore	5286	Rispettabilità	137
Disprezzo	1673	Avversione	572
Merito	10483	Virtù	3229
Innocenza	1266	Candore	385
Ragione	20622	Intelletto	866
Saggezza	1598	Sennò	443
Destino	7064	Sorte	3578
Inganno	1197	Bugia	703
Sospetto	4266	Diffidenza	1371

4.1.2 Method and procedure

The pre-test questionnaire was administrated to 20 collaborators (16 women and 4 men) whose age ranged from 19 to 28 years ($M = 24.10$ $SD = 2.65$). They were recruited through personal contacts. Collaborators responded to the pre-test questionnaire on the online platform survey Qualtrics (*Qualtrics*, 2020). They were asked to assign titles to 12 artworks choosing between the two options described above. We also added a list of criteria from which participants could indicate how they chose the title to understand better the underline processes and strategies used (see table. 3).

Table 3. List of criteria showed to participants

	List of Criteria
1	Ho tentato di capire se l'espressione facciale fosse coerente con uno dei due titoli
2	Ho tentato di capire se la postura della persona fosse coerente con uno dei due titoli
3	Ho tentato di capire cosa stesse accadendo all'interno della scena
4	Ho tentato di capire se la parola fosse adeguata all'atmosfera generale
5	Ho tentato di capire il significato degli oggetti intorno al personaggio
6	Ho tentato di capire quale fosse il linguaggio più adatto per un quadro di quei tempi
7	Ho scelto la parola più semplice
8	Ho scelto la parola più sofisticata
9	Ho scelto la parola più comune e comprensibile
10	Ho scelto la parola meno comune e più aulica
11	Ho seguito l'istinto senza usare criteri specifici

4.1.3 Results

We ran a binomial test to compare the percentages of participants choosing a gender-congruent title vs a gender-incongruent title but no clear pattern emerged in terms of title's assignment as we can observe in Table 4. On 6/12 artworks participants chose a gender-congruent title in line with the personification's gender and on 5/12 artworks participants chose a gender-incongruent title. However, on 7/12 pairs of concepts the title's assignment did not differ from chance.

Table 4. Binomial test on pairs of concepts

Pairs of concepts	Artwork original title	Personification's gender	% Gender-congruent title	p
Colpa-Sbaglio	Colpa	Man	.70	.115
Incredulità-Scetticismo	Incredulità	Man	.75	.041
Intemperanza-Squilibrio	Intemperanza	Man	.70	.115
Onore-Rispettabilità	Onore	Man	.65	.263
Disprezzo-Avversione	Disprezzo	Man	.35	.263
Merito-Virtù	Merito	Man	.20	.012
Innocenza-Candore	Innocenza	Woman	.30	.115
Ragione-Intelletto	Ragione	Woman	.75	.041
Saggezza-Sennò	Saggezza	Woman	.50	1.00
Destino-Sorte	Destino	Woman	.60	.503
Inganno-Bugia	Inganno	Woman	.10	<.001
Sospetto-Diffidenza	Sospetto	Woman	.25	.041

Participants were not affected by the word frequency of the words, on 6/12 artworks participants chose the title with a higher word frequency, and on 5/12 artworks they chose the title with the lower word frequency, so no ancient-modern effect emerged.

Regarding the criteria, participants could select one or more criteria that they used throughout the task: 70% of participants relied on the facial expression, 45% on the protagonist's posture, 45% on the general atmosphere of the artwork to assign the title and, 40% of participants relied on instinct. Since from the pre-test no biases emerged, we implemented the task in the questionnaire.

4.2 Survey design and materials

The survey was developed on the online survey platform Qualtrics (*Qualtrics*, 2020) and included three tasks: the evaluation of masculinity-femininity of abstract nouns, the evaluation of positivity-negativity of abstract nouns, and the title assignment to 12 artworks.

4.2.1 Evaluation of masculinity-femininity of abstract nouns

To briefly summarize, we expected grammatically feminine abstract nouns to be perceived as more feminine and grammatically masculine abstract nouns to be perceived as more masculine. We also predicted that this effect would be stronger when a gender-congruent personification was linked to the noun. Therefore, the task consisted in asking

participants to rate on a scale from 1 to 6 how much they perceived abstract nouns as masculine/feminine. Participants had to rate 60 abstract nouns from the initial list of 93 nouns used in the archival study. Of these, 30 had at least one gendered personification linked to them while the other 30 did not have any personification linked to them and were randomly extracted following a standardized procedure to balance the list. The procedure was as following: the 93 abstract nouns were split based on grammatical gender (30 grammatically masculine, 63 grammatically feminine) and, within these two categories, nouns were ordered by the level of abstractness. Then, for each personified nouns we selected the noun without a personification that was closer to it[1]. To make sure that abstractness scores of nouns without a personification were not systematically higher or lower than those of nouns with a personification, the noun without personification selected was either above or below the personified noun, alternating between the two. We also ensured that the 30 personified nouns (M = 549.03; SD = 35.90) did not differ in terms of abstractness from the 30 nouns without personification (M = 547.42; SD = 34.76) t (58) = -0.17, p = .860. Before presenting the list of nouns to rate the following message was shown to participants for 5 seconds:

Nel questionario che segue Le verrà proposta una lista di parole astratte.

Per ciascuna di queste parole indichi, quanto Le percepisce **femminili** o **maschili**, basandosi sulle prime immagini o associazioni che Le vengono in mente pensando al concetto che rappresentano.

La invitiamo a non soffermarsi troppo a lungo sulle singole parole.

4.2.2 Evaluation of positivity/negativity of abstract nouns

We also expected grammatically feminine nouns to be perceived as more positive/negative, mirroring the polarized social attitude towards women, and grammatically masculine nouns to be perceived as more neutral. To test this hypothesis, we asked participants to rate the same 60 abstract nouns on a scale from 1 to 6. Since the polarized view towards women emerges through cultural artifacts, we also expected a stronger effect towards feminine abstract nouns linked to a congruent-gendered

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[1] Starting from the personified noun that was positioned closer to the center of the list we selected the noun without a personification that was closer to it. The procedure was repeated every time a personified noun was encountered, moving from the center to the extremities of the list.

personification. Similar to the previous task, the following message was shown to participants for 5 seconds before starting the rating.

Nel questionario che segue Le verrà proposta una lista di parole astratte.

Per ciascuna di queste parole indichi, quanto Le percepisce **negativamente o positivamente** , basandosi sulle prime immagini o associazioni che Le vengono in mente pensando al concetto che rappresentano.

La invitiamo a non soffermarsi troppo a lungo sulle singole parole.

4.2.3 Reverse gender-congruency effect in artworks

Finally, we showed participants the 12 artworks tested in the pre-test, and we asked them to name the abstract concept depicted in the painting between two possible options, one was the actual abstract concept portrayed by the artist and the other one was a synonym of the opposite grammatical gender (e.g., "sorte", feminine – "destino", masculine). We hypothesize a tendency to assign a gender-congruent abstract title to the cultural artifact regardless of the original concept depicted by the artist. The goal of this task was to observe if participants were more likely, especially when facing a gender-incongruent personification, to assign an abstract concept in line with the gender of the personification. If this assumption stands, and people do indeed tend to re-establish a gender congruency effect, we could hypothesize that gender-incongruent personifications throughout history are the result of cultural choices that overrule the influence of grammatical gender to depict intentionally some abstract concepts as men or women.

4.3 Survey procedure and distribution

4.3.1 Sample

The sample consisted of 200 participants (66 men, 130 women, 4 non-binary people) whose age ranged from 18 to 70 years ($M = 40.0$ $SD = 13.5$). Most of the recruitment was carried out online through social medias (e.g., WhatsApp, Facebook) and via word of mouth. The sample prevalently consisted in workers (73.5%) and students (16%). Regarding the level of education, the sample reported a general medium-high level of education: 22% of participants reported as highest-level high school diploma, while

77% of the sample reported to have at least a bachelor's degree (17.5% bachelor's degree; 41% master's degree; 18.5% PhD/doctorate).

4.3.2 Procedure

As reported earlier, the survey included three tasks: 1) The evaluation of masculinity-femininity of abstract nouns where participants were asked to rate their perception of masculinity-femininity of 60 abstract nouns; 2) The evaluation of positivity-negativity of abstract nouns where they were asked to rate their perception of negativity-positivity of the same 60 nouns; 3) The reverse gender-congruency effect task where they had to assign a title to 12 artworks. The survey also included a final demographic section plus 3 items which served as measure of the artistic knowledge and background of the participants. The survey lasted approximately 15 minutes.

4.3 Results

4.3.1 Gender congruency effect in abstract concepts

To test the perception of masculinity-femininity of abstract nouns we first checked the correlation between perceived femininity of the nouns extracted from Cervone et al. (2022) and preceived femininity of the nouns in our sample, r (60) = .71, p <.001. The correlation confirmed that there was consistency between our data and previous data collected.

A 2 (presence vs. absence of personifications) x 2 (masculine vs feminine grammatical gender) ANOVA confirmed again a strong effect for grammatical gender, F (1,56) = 115.66, p < .001, η^2_p = .67, showing that grammatically feminine concepts were perceived as more feminine (M = 2.85; SD = 0.99) than grammatically masculine concepts (M = 4.12; SD = 0.63) regardless of the presence/absence of cultural artifacts. More interesting, an interaction between the two variables, F (1,56) = 4.76, p = .033, η^2_p = .078, shows that the grammatical gender difference is even more pronounced in the presence of cultural artifacts (Figure 4).
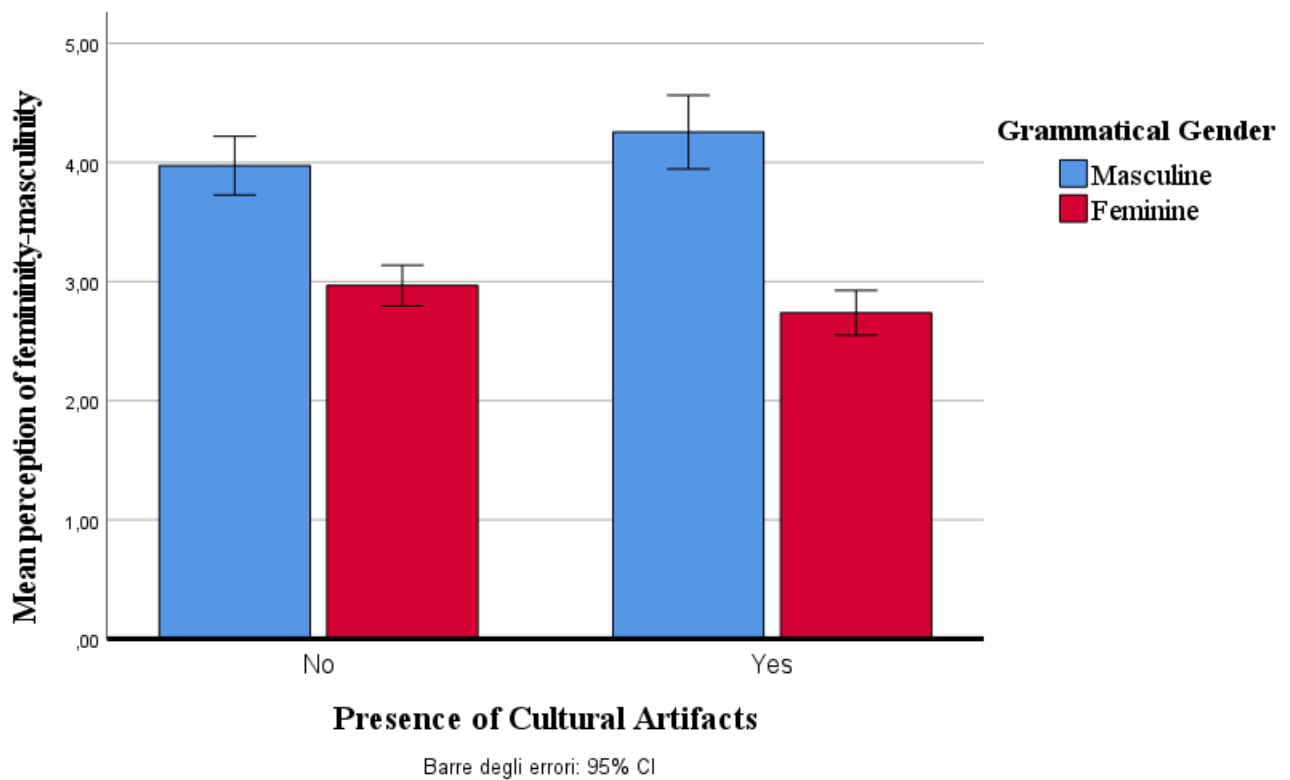
Figure 4. Mean perception of femininity-masculinity in abstract concepts

Specifically, in Table 5 we can better observe the descriptive statistics and the mean differences between concepts linked to a personification and concepts without a personification linked to them.

Table 5. Perception of masculinity-femininity in masculine and feminine concepts

Grammatical Gender	Personification	Mean	SD
Masculine	No	3.97	0.44
	Yes	4.26	0.31
Feminine	No	2.97	0.42
	Yes	2.74	0.40

As we can observe, abstract nouns without a personification were perceived as more feminine ($M = 2.97$; $SD = 0.42$) or masculine ($M = 3.97$; $SD = 0.44$) in line with the grammatical gender of the noun independently of the presence/absence of cultural artifacts confirming the presence of a significant gender congruency effect. Furthermore, an independent t-test confirmed that the mean difference between grammatically feminine

and masculine nouns without a personification was significant, t (32) = 6.42, p <.001; d = 2.32.

Similarly, abstract nouns with a personification were also perceived as more feminine (M = 2.74; SD = 0.40) or masculine (M = 4.26; SD = 0.31) in line with the grammatical gender of the noun, and an independent t-test also confirmed a significant difference between the means t (24) = 8.98, p <.001, d = 4.28.

These analyses were then replicated by using the 200 participants as measure of unit instead of the 60 abstract nouns. Firstly, we divided the 60 abstract nouns into 4 groups: grammatically masculine nouns with personification (α = .830), grammatically masculine nouns without a personification (α = .838), grammatically feminine nouns with personification (α = .886) and grammatically feminine nouns without a personification (α = .909). Secondly, to compare the effect of participants' gender on the 4 groups a 2 (presence vs absence of personification) x 2 (masculine vs feminine grammatical gender) x 2 (participant gender: male vs female[2]) ANOVA with repeated measures on the first two variables was performed. There was a statistically significant effect of grammatical gender F (1,194) = 121.06, p < .001, η^2_p = .384, a statistically significant interaction between grammatical gender and the presence/absence of personifications F (1,194) = 33.45, p <.001, η^2_p = .147, a statistically significant interaction between participants' gender and the presence/absence of personifications F (1,194) = 4.90, p = .028, η^2_p = .025, and a statistically significant interaction between grammatical gender, participants' gender and the presence/absence of personifications F (1,194) = 3.91, p =.050, η^2_p = .020. To understand better this latter factor, we conducted separate analyses based on the participants' gender. In table 6 we can observe the descriptive statistics of men and women separately:

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[2] Non-binary people were excluded from the analysis due to the low numerosity inside the sample

Table 6. Perception of masculinity-femininity in men and women

Participants' Gender	Grammatical Gender	Cultural Artifacts	Mean	SD
Man	Masculine	No	4.12	0.99
		Yes	4.25	0.93
	Feminine	No	2.93	0.87
		Yes	2.83	0.87
Woman	Masculine	No	3.97	0.93
		Yes	4.11	0.93
	Feminine	No	2.98	0.78
		Yes	2.66	0.66

A 2 (masculine vs feminine grammatical gender) x 2 (presence vs absence of personification) repeated measures ANOVA was performed separately for men and women. For men, a significant effect of grammatical gender $F (1,65) = 39.83$, $p < .001$, $\eta^2_p = .380$ and a significant interaction of grammatical gender and cultural artifacts $F (1,65) = 7.54$, $p = .008$, $\eta^2_p = .104$ emerged. Moreover, men perceived abstract nouns as more feminine or masculine in line with the grammatical gender of the noun regardless of the presence/absence of cultural artifacts, however when present, cultural artifacts interacted with the grammatical gender by enhancing the gender congruency effect.

For women, a significant effect of grammatical gender $F (1,129) = 94.68$, $p < .001$, $\eta^2_p = .423$, and a significant interaction of grammatical gender and cultural artifacts $F (1,129) = 39.25$, $p < .001$, $\eta^2_p = .233$ also emerged, as well as an independent effect of cultural artifacts $F (1,129) = 8.31$, $p = .005$, $\eta^2_p = .061$. Interestingly, this gender difference was not influenced by the prior artistic knowledge or by the age of the participants although a significant difference in the level of education between women ($M = 4.67$, $SD = 1.01$) and men ($M = 4.33$, $SD = 1.13$) emerged in an independent t-test $t (194) = -2.12$, $p = .035$.

Ultimately, we performed another t-test in order to understand better this gender difference. We created the new variable "personification sensitivity" to account for how much participants were sensitive to the presence/absence of personifications when they had to rate the masculinity-femininity of the nouns. We first calculated the "gender-congruency bias for nouns with personifications", which was the mean of the difference between means of masculine and feminine nouns with personification. This variable

accounted for how much participants perceived nouns with personifications as masculine/feminine in line with the gender-congruency effect. The same process was repeated for nouns without a personification and the "gender congruency bias for nouns without a personification" was calculated. The "personification sensitivity" variable was the result of the difference between the gender congruency bias of nouns with personification and nouns without it. From an independent t-test a significant difference between the means emerged in terms of personification sensitivity between men ($M =$ 0.23, $SD =$ 0.68) and women ($M =$ 0.47, $SD =$ 0.47) t (194) = -1.98, $p =$ .050. In other words, in the presence of a personification, women tended to perceive nouns as more masculine or feminine in line with the gender-congruency effect and showed to be sensible to the presence of a cultural artifact while men did not show this sensitivity.

4.3.2 Perception of positivity/negativity of abstract nouns

Regarding the perception of positivity/negativity we hypothesized that grammatically feminine nouns would be perceived as more positive or negative in terms of valance compared to grammatically masculine nouns which would be perceived as more neutral.

To compute this analysis and see if masculine nouns were indeed closer to the midpoint compared to feminine nouns, we created a new variable "ambivalence-neutrality" that was obtained by subtracting 3.5 (mid-point of the 6-point scale) to each participant rating and then transforming the negative numbers into positive numbers. Therefore, a number closer to zero in this variable indicated that the rating was closer to the initial mid-point while a number closer to 3.5 indicated that originally the rating was closer to the extremities of the 6-point scale.

From an independent samples t-test, no significant difference emerged in terms of valence between masculine ($M =$ 1.01; $SD =$ 0.55) and feminine ($M =$ 1.20; $SD =$ 0.63) nouns. Grammatically feminine nouns were not perceived as more positive or negative compared to masculine nouns t (58) = -1.12, $p =$ .268. However, from the correlations, a relation emerged between the perception of femininity-masculinity and the perception of negativity-positivity, r (60) = -.312, $p =$.015. The correlation shows that nouns that are perceived as more feminine are also more likely to be perceived as more positive in terms of valence. This result was also confirmed by the correlation between the perception of

negativity-positivity and the number of feminine cultural artifacts linked to each noun, *r* (60) = .304, *p* = .018. This relation shows that increasing the number of feminine cultural artifacts linked to the noun it increases also the positive perception of the noun (Table 7).

Table 7. Correlation between femininity-masculinity and negativity-positivity perception

	Femininity-Masculinity perception	Negativity-Positivity perception
Femininity-Masculinity perception	1	-.312*
Negativity-Positivity perception	-.312*	1
N° of feminine personifications	-.324*	.304*

*p < .05

4.3.3 Reverse gender-congruency effect in artworks

To analyze the final task where participants were asked to assign titles to 12 artworks between two possible options (original title and OGS) we ran a binomial test to compare the percentages of participants choosing a gender-congruent title vs a gender-incongruent title. Participants did not choose the title based on the personification' gender, however a binomial test showed that the choice to assign the title was not the result of a random choice. In Table 8 we can observe in detail the results from the binomial test.

Table 8. Binomial test on 12 pairs of concepts

Pairs of concepts	Artwork original title	Personification's gender	% Gender-congruent title	p
Colpa-Sbaglio	Colpa	Man	.66	< .001
Incredulità-Scetticismo	Incredulità	Man	.53	.437
Intemperanza-Squilibrio	Intemperanza	Man	.61	.004
Onore-Rispettabilità	Onore	Man	.62	.001
Disprezzo-Avversione	Disprezzo	Man	.38	<.001
Merito-Virtù	Merito	Man	.28	<.001
Innocenza-Candore	Innocenza	Woman	.45	.137
Ragione-Intelletto	Ragione	Woman	.69	<.001
Saggezza-Sennò	Saggezza	Woman	.39	.001
Destino-Sorte	Destino	Woman	.68	<.001
Inganno-Bugia	Inganno	Woman	.15	<.001
Sospetto-Diffidenza	Sospetto	Woman	.38	.001

4.4 Discussion

In line with the results found in the archival study, our second study confirms a strong effect of grammatical gender on the perception of masculinity-femininity of abstract concepts showing that grammatically feminine and masculine nouns are perceived as more feminine or masculine in line with the grammatical gender, regardless of the presence/absence of cultural artifacts (see Hyp.1). Furthermore, the presence of cultural artifacts seems only to enhance the gender congruency effect by interacting with the grammatical gender (see Hyp. 2).

These analyses confirm the influence of grammatical gender and its interaction with cultural artifacts that already emerged earlier, however participants' gender also seems to play a role in the perception of masculinity-femininity of these concepts.

There seems to be an ingroup bias both for men and women in favor of their own gender. Aside from feminine nouns without a personification, men gave higher ratings to abstract concepts on the scale femininity-masculinity perception in line with the ingroup bias. Similarly, women gave lower ratings to abstract concepts on the same scale favoring their own gender.

Interestingly, apart from the ingroup bias, participants' gender also seems to play another role in the perception of masculinity-femininity of these concepts. From the analyses, it emerges that cultural artifacts interact with the grammatical gender by enhancing the perception of masculinity-femininity of the abstract concepts in line with

the grammatical gender in men; Moreover, in men, cultural artifacts do not seem to influence alone the perception of masculinity-femininity of abstract concepts, but they reinforce the gender congruency effect which seems driven to a large extent by grammatical gender.

Nevertheless, the presence of cultural artifacts exerts an independent influence in women's perception of masculinity-femininity. Therefore, women seem to be more sensitive to the presence of cultural artifacts, especially in the case of female personifications while men do not show this sensitivity. It seems that women are somehow more affected by the presence of female cultural artifacts linked to abstract concepts which are able to influence their perception of femininity of abstract nouns. In other words, personified feminine abstract nouns were perceived by women as more feminine than feminine abstract nouns without a personification.

Regarding our hypothesis about the perception of grammatically feminine nouns as more positive or negative in terms of valence in contrast with grammatically masculine nouns, the results did not confirm our hypothesis. Grammatically feminine nouns were not perceived as more positive or negative when compared to the masculine nouns in terms of difference between the means. However, a positive correlation emerged between the perception of femininity-masculinity and valence: specifically, nouns perceived as more feminine are also more likely to be perceived as more positive. This relation emerges also between the number of feminine cultural artifacts linked to nouns and valence, in other words nouns are more likely to be perceived as more positive when a feminine cultural artifact is linked to them. Even though this result does not confirm the ambivalent attitudes towards women reported by the literature, it shows a tendency to perceive feminine concepts as more positive in the presence of women's personification of the concept. The number of feminine cultural artifact linked to the concept represent to some degree the cultural collective imagination of women. So there seems to be a link between high abstract feminine concept and their perceived positive valence especially when they are culturally represented by women. This connection poses some questions about how these female personifications of high abstract concepts affect the social perception of women. Furthermore, the perceived positive valence linked to female cultural artifacts may be the reflection of one of the processes of subtyping women where women are put on a pedestal. This type of subtyping is characteristic of benevolent sexism

which includes a positive orientation of protection, idealization, and affection directed toward women (Glick & Fiske, 2001). However, benevolent sexism, just as hostile sexism, presumes women's inferiority but is subjectively positive as it sees women as wonderful and pure creatures who must be adored and placed on a pedestal but are also in need of protection (Glick & Fiske, 2001).

Additionally, as we suggested in Chapter 2, the super-humanization of women, as a result of being the cultural image of abstract concepts, could be considered as a form of positive dehumanization in which women are portrayed as symbols of Virtues and Values but still, they are not treated as completely human.

Finally, regarding our last hypothesis about participants' tendency to assign a gender congruent title to paintings and to restore a gender-congruency effect, the results did not confirm it and no significant relation emerged. Interestingly, the choice to assign the title was not random, as across 10 of 12 artworks participants showed a clear preference of one title over the other even if it did not follow the gender-congruency effect. This last hypothesis was born with an explorative intent, and it is not surprising that many other factors, which were not controlled, played a role in this task. Participants paid attention to facial expression, symbols, the general atmosphere of the artwork which are all factors that may have interfered with the gender congruency effect. Furthermore, participants used different strategies to approach this task, while some of them followed instinct, some others chose a more rational approach and paid attention to symbols and expressions. The use of different strategies may be a factor to control in the future.

Chapter 5: General Discussion and Conclusions

5.1 General Discussion

To our knowledge, most prior studies investigated gendered images and gendered perception related to concrete nouns while it remained unclear whether the gender congruency effect also occurred for abstract concepts. The goal of this thesis was to investigate the perception of abstract concepts and to explore the gender congruency effect in this category while considering the possible influence of cultural artifacts.

Confirming Segel and Boroditsky's (2011) study, we also found that artist over-proportionally chose personifications of abstract concepts in line with grammatical gender. This was particularly evident for grammatically feminine nouns, which were depicted as female figures by artists 85% of the time. Interestingly, grammatically masculine nouns on the other hand were equally likely to be represented as men or women. It could be hypothesized that since there is a strong correspondence between femininity and abstractness deriving from Proto-Indo European and, consequently, abstract concepts are often represented by female figures, grammatically abstract masculine nouns could also be represented by female figures which may have become a Western cultural symbol for the representation of any abstract concept.

Secondly, both our studies suggest a significant influence of grammatical gender in the perception of masculinity-femininity of abstract concepts. Furthermore, our findings suggest also a relation between gendered artistic representations and gendered perception of the concept, in fact, cultural artifacts seem to interact with the grammatical gender by enhancing the perception of masculinity-femininity of the abstract concept in line with the grammatical gender. It is important to highlight that grammatically feminine and masculine nouns are perceived as more feminine or masculine in line with the grammatical gender, regardless of the presence/absence of cultural artifacts: the presence of cultural artifacts seems only to reinforce the gender congruency effect by interacting with the grammatical gender. These results are partially in contrast with Beller et al., (2015) and Bender et al., (2016b), as they showed strong gender congruency effect for abstract nouns with gender-congruent personifications but not in abstract nouns with gender-incongruent personifications where the gender of the cultural artifact won over the grammatical gender, In our second study, the presence of cultural artifacts seems only

to enhance the masculinity-femininity perception, and the influence of grammatical gender is not overridden by the presence of incongruent cultural artifacts.

Although a difference between means does not emerge in terms of valence between masculine and feminine concepts, it does emerge that nouns linked to a female cultural artifact are perceived as more feminine and are also more likely to be perceived as more positive. Even though the virgin/whore dichotomy was not detected, there seems to be a tendency to perceive a concept as more positive when it is culturally personified as a woman. As outlined in the previous discussion, perceiving cultural artifacts portrayed by women as more positive may be a reflection of subtyping women as women are put on a pedestal and, in line with benevolent sexism, seen as wonderful and pure creatures.

Additionally, participants' gender also seems to play a role in the perception of masculinity-femininity of these concepts. It seems that women tend to be more sensitive to the presence of cultural artifacts, especially in the case of female personifications. This result suggests that the exposure to multiple female personifications throughout life does somehow affect women and the collective representation of them. Belonging to the target group of gender discrimination may lead women to be more aware of female cultural artifacts and in general of the social representation of them in the arts and in the media. Interestingly, as reported earlier, abstract concepts linked to female cultural artifacts not only were perceived as more feminine but also as more positive. Since our sample included 166 women vs 40 men, we could argue that women themselves tend to perceive abstract concepts incarnated by women as more positive. There may be a few possible explanations. On one hand, women may perceive abstract concepts linked to female cultural artifacts as more positive since they feel represented by this cultural image that portrays women as vessels of high values, on the other hand evaluating these concepts as more positive may reflect women endorsement in benevolent sexism which prays the more traditional subtypes of women.

Ultimately, another possible consequence of the association between femininity and abstract concepts is the lead to the super-humanization of women, as a result of being the cultural image of abstract concepts. Super-humanizing women could be considered as a form of positive dehumanization in which women are portrayed with positive characteristics but, at the same time, they are not treated as completely human. Goddesses, graces, and divinities tend to reinforce an image of women as perfect and pure which is

unrepresentative of and inaccessible to living women (Thompson, 2015). The female aspect trope itself may reflect a process of positive dehumanization since women incarnating abstract concepts do not possess an identity or any other human traits apart from the concept they represent. To our knowledge, no literature has yet investigated the process of super-humanization towards women, but it would be interesting to explore in the future how it affects them and its relationship with subtyping and gender stereotypes.

In conclusion, we suggest that cultural artifacts may play a role not only by enhancing the gender congruency effect driven by grammatical gender but also by reinforcing the process of subtyping gender stereotypes and consequently benevolent sexism especially in women. The question "how does the association between femininity and abstractedness affects women and their portrayal in the cultural collective imagination" remains partially unanswered. However, from this thesis, it has become clear that many factors such as gender stereotypes, positive dehumanization, and benevolent sexism may be connected and activated by cultural artifacts especially in women.

5.2 Limits and future directions

Both the archival and the survey study present some limits. For instance, since abstract nouns tend to carry the feminine grammatical gender in Italian, our list of abstract concepts, which was extracted from DellaRosa's Dataset (2010), contained few grammatically masculine nouns (N = 21) compared to the grammatically feminine nouns (N = 196). The low numerosity of grammatically masculine nouns inside our dataset did not allow us to draw conclusions about them.

Additionally, since we considered only nouns with abstractedness > 500, of 93 abstract concepts only 30 had at least one cultural artifact linked to them. This may be due to the fact that high abstract concepts are often difficult to represent. Consequently, most of the words on our list did not, in fact, possess any cultural artifact linked to them. Future studies should consider broadening the list of abstract concepts to allow the detection of more cultural artifact and to explore better the cultural influence exerted by them.

It would be also interesting to explore deeper how women are socially affected throughout life by the exposure to multiple female personifications of highly abstract

concepts such as liberty, justice, and victory. Moreover, future studies should investigate the possible relation between the super-humanization of women, benevolent sexism, positive dehumanization and subtypes of gender stereotypes such as "women are wonderful and perfect creature". Furthermore, it would be also interesting to investigate women's own perception of their cultural representation and their process of identification with it.

Ultimately, it would be also interesting to explore better the possibility to reverse a gender-congruency effect starting from the representation of abstract concepts, by improving the task and by controlling for external variables that may have interfered with the task. For instance, time taken to complete the task is surely a variable which must be controlled in the future: a fraction of participants followed instinct and did not spend much time on these tasks, whereas another group of participants chose a more rational approach and paid much more attention to details and symbols which may have interfered with the original task. Additionally, it would be also advisable to increase the number of artworks shown to participants and to carefully check the grade of overlapping between the abstract concept and the opposite gender synonym (OGS).

5.3 Conclusions

Grammatical gender seems to exert a strong influence in the perception of abstract concepts as masculine-feminine in line with the gender congruency effect. Cultural artifacts seem to play a role only by interacting with grammatical gender. Still, these gendered artifacts remain part of the collective imagination of the concepts they embody more than we realize. For instance, women seem to be influenced also by the presence of cultural artifacts alone, especially in the case of female personifications. Even though the question about the social consequences of the association between abstractness and femininity and women's portrayal in the cultural collective imagination remains partially unanswered, this thesis suggests that factors such as gender stereotypes, benevolent sexism and positive dehumanization may be connected with cultural artifacts and affect women's perception of their portrayal in the cultural collective imagination.

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Appendix

Annex 1. Perception of Femininity-Masculinity of 60 abstract nouns

	1-Chiaramente Femminile	2	3	4	5	6-Chiaramente Maschile
Immortalità	O	O	O	O	O	O
Derivazione	O	O	O	O	O	O
Destino	O	O	O	O	O	O
Lealtà	O	O	O	O	O	O
Tendenza	O	O	O	O	O	O
Futuro	O	O	O	O	O	O
Libertà	O	O	O	O	O	O
Infallibilità	O	O	O	O	O	O

	1-Chiaramente Femminile	2	3	4	5	6-Chiaramente Maschile
Onore	O	O	O	O	O	O
Intemperanza	O	O	O	O	O	O
Esasperazione	O	O	O	O	O	O
Incredulità	O	O	O	O	O	O
Paradiso	O	O	O	O	O	O
Incongruenza	O	O	O	O	O	O
Indiscrezione	O	O	O	O	O	O
Giudizio	O	O	O	O	O	O

	1-Chiaramente Femminile	2	3	4	5	6-Chiaramente Maschile
Suggestione	O	O	O	O	O	O
Virtù	O	O	O	O	O	O
Dovere	O	O	O	O	O	O
Mediocrità	O	O	O	O	O	O
Logica	O	O	O	O	O	O
Importanza	O	O	O	O	O	O
Mistero	O	O	O	O	O	O
Innocenza	O	O	O	O	O	O

	1-Chiaramente Femminile	2	3	4	5	6-Chiaramente Maschile
Assoluzione	O	O	O	O	O	O
Pretesto	O	O	O	O	O	O
Ragione	O	O	O	O	O	O
Maturità	O	O	O	O	O	O
Merito	O	O	O	O	O	O
Indolenza	O	O	O	O	O	O

	1- Chiaramente Femminile	2	3	4	5	6- Chiaramente Maschile
Unanimità	O	O	O	O	O	O
Invidia	O	O	O	O	O	O
Fervore	O	O	O	O	O	O
Definizione	O	O	O	O	O	O
Giustizia	O	O	O	O	O	O
Disprezzo	O	O	O	O	O	O
Indipendenza	O	O	O	O	O	O
Curiosità	O	O	O	O	O	O

	1- Chiaramente Femminile	2	3	4	5	6- Chiaramente Maschile
Motivo	O	O	O	O	O	O
Critica	O	O	O	O	O	O
Felicità	O	O	O	O	O	O
Frenesia	O	O	O	O	O	O
Sospetto	O	O	O	O	O	O
Seduzione	O	O	O	O	O	O
Analogia	O	O	O	O	O	O
Fascino	O	O	O	O	O	O

	1- Chiaramente Femminile	2	3	4	5	6- Chiaramente Maschile
Filosofia	O	O	O	O	O	O
Differenza	O	O	O	O	O	O
Incantesimo	O	O	O	O	O	O
Saggezza	O	O	O	O	O	O
Preferenza	O	O	O	O	O	O
Colpa	O	O	O	O	O	O
Impulso	O	O	O	O	O	O
Indifferenza	O	O	O	O	O	O

	1- Chiaramente Femminile	2	3	4	5	6- Chiaramente Maschile
Vergogna	O	O	O	O	O	O
Inganno	O	O	O	O	O	O
Irritazione	O	O	O	O	O	O
Fiducia	O	O	O	O	O	O
Stile	O	O	O	O	O	O
Impazienza	O	O	O	O	O	O

Rispetto all'esercizio appena svolto, quante parole sconosciute ha incontrato? Inserire una cifra approssimativa

[   ]

Annex 2. Perception of Negativity-Positivity of 60 abstract nouns

	1- Chiaramente Negativo	2	3	4	5	6- Chiaramente Positivo
Immortalità	O	O	O	O	O	O
Derivazione	O	O	O	O	O	O
Destino	O	O	O	O	O	O
Lealtà	O	O	O	O	O	O
Tendenza	O	O	O	O	O	O
Futuro	O	O	O	O	O	O
Libertà	O	O	O	O	O	O
Infallibilità	O	O	O	O	O	O

	1- Chiaramente Negativo	2	3	4	5	6- Chiaramente Positivo
Onore	O	O	O	O	O	O
Intemperanza	O	O	O	O	O	O
Esasperazione	O	O	O	O	O	O
Incredulità	O	O	O	O	O	O
Paradiso	O	O	O	O	O	O
Incongruenza	O	O	O	O	O	O
Indiscrezione	O	O	O	O	O	O
Giudizio	O	O	O	O	O	O

	1- Chiaramente Negativo	2	3	4	5	6- Chiaramente Positivo
Suggestione	O	O	O	O	O	O
Virtù	O	O	O	O	O	O
Dovere	O	O	O	O	O	O
Mediocrità	O	O	O	O	O	O
Logica	O	O	O	O	O	O
Importanza	O	O	O	O	O	O
Mistero	O	O	O	O	O	O
Innocenza	O	O	O	O	O	O

	1- Chiaramente Negativo	2	3	4	5	6- Chiaramente Positivo
Assoluzione	O	O	O	O	O	O
Pretesto	O	O	O	O	O	O
Ragione	O	O	O	O	O	O
Maturità	O	O	O	O	O	O
Merito	O	O	O	O	O	O
Indolenza	O	O	O	O	O	O

	1-Chiaramente Negativo	2	3	4	5	6-Chiaramente Positivo
Unanimità	O	O	O	O	O	O
Invidia	O	O	O	O	O	O
Fervore	O	O	O	O	O	O
Definizione	O	O	O	O	O	O
Giustizia	O	O	O	O	O	O
Disprezzo	O	O	O	O	O	O
Indipendenza	O	O	O	O	O	O
Curiosità	O	O	O	O	O	O

	1-Chiaramente Negativo	2	3	4	5	6-Chiaramente Positivo
Motivo	O	O	O	O	O	O
Critica	O	O	O	O	O	O
Felicità	O	O	O	O	O	O
Frenesia	O	O	O	O	O	O
Sospetto	O	O	O	O	O	O
Seduzione	O	O	O	O	O	O
Analogia	O	O	O	O	O	O
Fascino	O	O	O	O	O	O

	1-Chiaramente Negativo	2	3	4	5	6-Chiaramente Positivo
Filosofia	O	O	O	O	O	O
Differenza	O	O	O	O	O	O
Incantesimo	O	O	O	O	O	O
Saggezza	O	O	O	O	O	O
Preferenza	O	O	O	O	O	O
Colpa	O	O	O	O	O	O
Impulso	O	O	O	O	O	O
Indifferenza	O	O	O	O	O	O

	1-Chiaramente Negativo	2	3	4	5	6-Chiaramente Positivo
Vergogna	O	O	O	O	O	O
Inganno	O	O	O	O	O	O
Irritazione	O	O	O	O	O	O
Fiducia	O	O	O	O	O	O
Stile	O	O	O	O	O	O
Impazienza	O	O	O	O	O	O

Annex 3. Task of Reverse gender congruency effect (12 artworks)

○ Colpa
○ Sbaglio



○ Scetticismo
○ Incredulità

O Intemperanza

O Squilibrio

O Senno

O Saggezza

○ Candore
○ Innocenza

○ Destino
○ Sorte

- Inganno
- Bugia

- Sospetto
- Diffidenza

- Virtù
- Merito

- Rispettabilità
- Onore

○ Disprezzo
○ Avversione

○ Intelletto
○ Ragione

Annex 4. Items regarding artistic knowledge and criteria used for the third survey task

Quanti quadri ha riconosciuto di quelli presentati?

[_____ v]

Ha utilizzato qualche criterio specifico per scegliere il concetto astratto rappresentato nei quadri?

○ NO

○ SI (Se si. specificare)

Secondo Lei, qual era lo scopo reale dell'ultimo esercizio appena svolto "IL CONCETTO NASCOSTO"?

Annex 5. Demographics

DEMOGRAFICHE

Genere

○ Maschile

○ Femminile

○ Non Binario (è possibile specificare)

[_____]

Età (in cifre)

[_____]

Livello di istruzione

[_____ ⌄]

Occupazione

○ Studente/Studentessa

○ Studente Lavoratore/Studentessa Lavoratrice

○ Lavoratore Dipendente

○ Lavoratore Autonomo/a

○ Disoccupato/a

○ [_____] Altro (specificare)

Ha conseguito studi o lauree nell'ambito artistico?

○ No

○ Si (se si, specificare)

[_____]
[   ]
[   ]
[_____]

Quanto appassionatə si definirebbe rispetto all'arte?

[_____ ⌄]