Gender is a multifaceted concept: Evidence that specific life experiences differentially shape the concept of gender

Gender is a multifaceted concept

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Abstract

Gender has been the focus of linguistic and psychological studies, but little is known about its conceptual representation. We investigate whether the conceptual structure of gender—as expressed in participants' free-listing responses—varies according to gender-related experiences in line with research on conceptual flexibility. Specifically, we tested groups that varied by gender identity, sexual orientation and gender-normativity. We found that different people stressed distinct aspect of the concept. For example, normative individuals mainly relied on a bigenderist conception (e.g., male/female; man/woman), while non-normative individuals produced more aspects related to social context (e.g., feminism, queer, fluidity, construction). At a broader level, our results support the idea that gender is a multifaceted and flexible concept, constituted by social, biological, cultural, and linguistic components. Importantly, the meaning of gender is not exhausted by the classical dichotomy opposing sex, a biological fact, with gender as its cultural counterpart. Instead, both aspects are differentially salient depending on specific life experiences.

1. Introduction

Categories and concepts are what allow us to coherently make sense of the world: they constitute the "bricks" of thought (Murphy, 2002). Importantly, concepts are said to be flexible representations, re-enacting relevant information about a given category in a specific situation (Kiefer & Barsalou, 2013). A large body of evidence demonstrates that the structure of categories and concepts varies as a function of context, both if considered as the physical context in which people are asked to judge sentences, and when considering the linguistic context (or frame) in which people produce features of concepts (for a review see Yee & Thompson-Schill, 2016). Even in tasks explicitly addressing semantic access, the activation of salient semantic features generally depends on task conditions and is dynamically tied to the context (Lebois, Wilson-Mendenhall & Barsalou, 2015; Borghi & Barsalou, in press). Concepts also show flexibility across individuals and within the same individual over time, and as a function of changing points of view (e.g., Barsalou & Sewell, 1984). The capacity to retrieve different information in different situations for the same concept has been robustly demonstrated both with behavioral tasks (e.g., Barsalou, 1987) and through neuroimaging techniques (Hoenig et al., 2008; Wilson-Mendenhall et al., 2011).

Together with task contexts, linguistic and cultural contexts can also affect categories. As the growing number of studies concerned with the linguistic and cultural relativism testifies, concepts of time (Boroditsky et al., 2011), space (Majid et al., 2004), motion (Papafragou, Hubert & Trueswell, 2008), color (Regier & Kay, 2009) odor (Majid et al., 2018), and moral concepts (Casasanto, 2009) are influenced by the linguistic, cultural, social, and experiential environment, demonstrating how variable concepts can be across groups of people in different environments (see Malt & Majid, 2013).

In order to reveal insights about conceptual structure, linguistic tasks such as word-associations or feature- and property-generation tasks are among the most commonly employed

tools (e.g., McRae et al., 2005). The latter, for example, shed light on some of the relevant features incorporated in the representation of abstract concepts, such as introspective and experiential relations (e.g., Barsalou & Wiemer-Hastings, 2005), and show how abstract concepts are characterized by fewer intrinsic properties and more complex situational relations in their representation (Wiemer-Hastings & Xu, 2005; Barca, Mazzuca & Borghi, 2017). Given the higher contextual dependency of abstract concepts compared to concrete concepts (Borghi & Binkofski, 2014), their representation might be more flexibly tied to the social context and personal experiences.

While traditional theories contend that abstract and concrete concepts engage different semantic systems (e.g., Paivio, 1986; Brysbaert, Warriner & Kuperman, 2014), recent approaches have started to reconsider the classic dichotomy between purely "abstract" and purely "concrete" concepts (Borghi et al., 2018a, 2018b, 2019; Barsalou, Dutriaux & Scheepers, 2018). Specifically, in a situated perspective (e.g., Barsalou, 2008), both concrete and abstract concepts include situational and perceptual information, and support goal-oriented actions. In this light, abstract concepts can be considered as being represented in a multidimensional semantic space with regions that partly overlap with the semantic space of concrete concepts (Troche, Crutch and Reilly, 2014; 2017; Binder et al., 2005; Harpaintner, Trumpp & Kiefer, 2018).

Abstract concepts also show high intra-class variability (Ghio et al., 2013; Borghi et al., 2018b; Desai et al., 2018). For instance, Roversi, Borghi and Tummolini (2013) compared properties listed for "social entities" such as "party" with properties listed for "institutional artifacts" such as "ownership" in a property-generation task and found that although both classes of concepts could broadly be considered "social", each elicited distinct properties: "social entities" elicited a higher proportion of contextual features, while "institutional artifacts" were conceptualized as regulating social artifacts (e.g., a signature ratifies the validity

of an attestation). So, some abstract concepts are more linked to linguistic and social experience, while others have a more salient affective and experiential component (Prinz, 2002; 2012). More generally abstract concepts might be considered a heterogeneous class, grounded in multiple systems, including perception, action and sensori-motor components just like concrete concepts, but also language, emotion and sociality (cf. Borghi et al., 2018a; 2019; Desai, Reilly & van Dam, 2018; Mellem, Jasmin, Peng & Martin, 2016). These grounding mechanisms might contribute to the representation of specific abstract concepts to different extents.

1.1. Is Gender an Abstract Concept?

Gender is an interesting concept to think about in this context. It can be considered an embodied social concept in which both concrete (e.g. sexual and biological factors) and abstract components (related to social interpretation) are relevant. In fact, recent research has proposed the hybrid label "gender/sex" pointing to the coupling of biological, physical and perceptual factors with the social and cultural in the constitution of gendered and sexual identities (van Anders, 2015; Fausto-Sterling, 2019). This contrasts with the traditional distinction between sex as the natural datum of biological sex (hormones, genes, genitalia etc.), and gender as the province of social and cultural practices built upon a supposed sexual dimorphism. The sex-gender distinction dates back to feminist works (e.g., Rubin, 1975) aimed at opposing the biological determinism at the basis of women's discrimination. Separating sex from gender allowed feminists to show that gendered traits (Bem, 1974), and more broadly genders (West & Zimmerman, 1987), are at least in part products of social practices (Haslanger, 1995; Risman, 2004). Nonetheless, scholars such as Butler (1990) have made clear that not only "abstract" notions such as gender roles, but also our sexed bodies (Fausto-Sterling, 1993; 2012) are defined by cultural practices and do not exist outside social meanings (Butler, 1993a).

Within psychology, gender is perhaps one of the most employed constructs. Psychological research has focused on gender/sex differences relying on a binary gender system

that opposes men to women. Specifically, a binary gender system presupposes that "there are two discrete categories into which all individuals can be sorted […] and one's category membership is biologically determined, apparent at birth, stable over time, salient and meaningful to the self, and a host of psychological variables" (Hyde et al., 2019, p. 1). On this basis scientists have attempted to unravel traits and attitudes that distinguish the two categories. By the means of instrumental constructs, such as gender-schematicity (Bem, 1981) or gender-consistency, scholars have tried to explain the degree of gender-congruence of individuals from childhood to adulthood.

Another line of research specifically addresses gendered social stereotypes, showing how these implicitly guide people's expectations, judgements and perception of individual men and women (for a review see Ellemers, 2018). For instance, traits such as assertiveness, competence, warmth, and nurturance are valued differently in relation to men and women; overall, women are more frequently associated with family life, whereas men are associated with career advancement (Greenwald & Banaji, 1995). Importantly, implicit stereotypical gendered knowledge is also activated in language processing: the elaboration of linguistic information consistent with stereotypical gender-expectations (e.g., feminine pronouns and "nurse") has a cognitive advantage over grammatical and stereotypical gender mismatch (e.g., masculine pronouns and "nurse"; see e.g., Miersky, Majid & Snijders, 2019; Pesciarelli, Scorolli & Cacciari, 2019)

Other approaches focus instead on the influence of grammatical gender in cognitive processes such as categorization (e.g., Cubelli et al., 2011). Converging evidence suggests that speakers of gendered languages incorporate gender as a salient feature even when this is irrelevant, as in the representation of inanimate entities. For example, Spanish and French adults and children tend to assign feminine and masculine voices to objects according to the grammatical gender of the objects in their native languages (Sera et al., 2002), and Spanish and

German speakers remember noun-object parings better when the noun of the object matches the grammatical gender of the object in their language (Boroditsky & Schmidt, 2000; for a systematic review see Samuel, Cole & Eacott, 2019).

1.2. Challenges to the Binary Gender System.

While the "bigenderist assumption" dominates the scientific literature, an emerging area of research from cognitive science and biology questions the binary nature of gender (e.g. van Anders, Goldey & Kuo, 2011; Olson, Key & Eaton, 2015; Joel & Fausto-Sterling, 2016; Roughgarden, 2004; Jordan-Young & Rumiati, 2012; Joel, 2016). Notably, although most people are likely cisgender (i.e., people who perceive their assigned birth sex as congruent with their expressed and desired gender identity), individuals whose identities are not confined to the binary gender system (e.g., gender non-conforming, genderqueers, gender-diverse or transgender individuals) have been documented through history and across diverse cultures (Herdt, 1993; Devor, 1997). Attention to gender-nonconforming individuals in the psychological sciences is also promoted by the American Psychological Association, which in 2015 issued guidelines for best practices with transgender and gender-nonconforming individuals (APA, 2015)

Only recently have some scholars introduced in their measurements the notion of gender non-conforming or *genderqueer* (i.e. a person rejecting traditional gender categories such as man/woman), and they have begun to investigate gender identity without pathologizing gender-diverse individuals. For example, Galupo, Pulice-Farrow, and Ramirez (2017) asked a sample of 197 individuals who self-identified as either gender-variant or agender to describe their gender identities with the aim of investigating what non-binary individuals consider as central features of their gender identity. A thematic analysis of responses showed that fluidity, mixture and rejection of traditional bipolar dimensions such as masculinity and femininity were key features.

Experiences of non-binary feelings were also evident among "normative"[1] individuals in a study by Joel, Tarrasch, Berman, Mukamel and Ziv (2014) with Israeli participants. Joel and colleagues explored gender identity using a questionnaire which measured gender identity, gender dysphoria and gender performance (Multi-GIQ questionnaire, Joel et al., 2014; see also Jacobson & Joel, 2018; 2019) among people who identified themselves as men, women, and queer. They found that among self-identified men and women, over 35% of people reported feeling the "opposite" gender, both genders, or neither. This was especially prevalent in queer individuals, although no significant differences emerged between the three groups suggesting that far from being binary, gender is fluid and multidimensional.

To summarize, gender has been investigated from three broad perspectives: (1) relating to the representation of grammatical gender in language and thought, (2) as a characteristic related to the sense of one's own identity, and (3) in relation to social stereotypes. However, it is unclear how lay people conceptualize gender exactly. Is it something related to our physical and biological make-up or better characterized by social practices? Our study aimed at examining the concept of gender in Italian speaking participants.

1.3. The Current Study: How do Italian People Conceptualize Gender?

We adopted a common methodology used to investigate conceptual knowledge. We asked a sample of Italian speaking participants to list words they freely associated with the concept of *genere* 'gender'. Our study was conducted in Italy which is an interesting context to explore this question because of the specific linguistic and cultural particulars of this community. In the Italian language, *genere* ('gender'), is a polysemous word covering five areas of meaning. In addition to the social interpretation of sex[2] it also includes: (1) The original Latin notion of "genus" representing what species have in common, e.g., the genus Panthera, within the family Felidae, includes species such as lions and tigers. (2) A notion similar to the English meaning of *kind* or *type*. (3) Aesthetic canon—similar to the English *genre*—applying

to literature as well as to cinema, arts, and music. (4) The grammatical category distinguishing nouns into masculine or feminine classes, also used to differentiate individuals based on biological features. This distinction is not confined to animate entities, but also applies to inanimate entities on the basis of linguistic conventions—e.g., in Italian *philosophy* is feminine and *table* is masculine. This binary dichotomy may have ramifications for the general concept of "gender" too.

The concept of gender in Italian is also interesting because of the specific cultural and social context. Italy is a predominantly catholic country, and theological accounts of gender, sexuality and family politics are very prominent[3]. In Italian public debate, the English term *gender* is maintained in its English form as a derogatory term. It describes gender and queer studies as based on an "ideology" that undermines the structure of the traditional family and suggests the possibility of choosing one's own gender identity and sexual orientation (the so-called *ideology of gender*; see e.g., Garbagnoli, 2014; Bernini, 2016).

In order to investigate how Italian speakers represent the concept of gender, we used a free-listing paradigm. We were primarily interested in uncovering conceptual structure, and not in assessing participants' explicit attitudes towards gender-related issues. To avoid participants adopting social desirability strategies, we refrained from explicit measures such as questionnaires or scales measuring attitudes towards sexuality or gender-roles. Instead we focused on participants' own conceptual relations, thus opting for an approach more explicit than, for example, IAT (Greenwald, McGhee & Schwartz, 1998). Free-listing tasks, also termed *semantic fluency procedures*, are thought to make explicit the psychological proximity of concepts and words produced in sequence. The general assumption underlying this kind of task is that when a concept is activated in memory, be it recalled or spoken, it will in turn prime words and concepts which are semantically related or similar to it. This provides an indirect measure of the psychological saliency of concepts (see Crowe & Prescott, 2003).

We conducted the free-listing task with a diverse pool of Italian participants that were divided into three subgroups according to their gender identity, sexual orientation, and classification according to heteronormative or bigenderist benchmarks.

In line with the idea that abstract concepts are represented as multidimensional constructs (Borghi et al., 2018a; Barsalou et al., 2018), where both embodied and contextual aspects interact, we expected that across all participants we would find evidence of the duality of *genere* 'gender' in Italian, such that participants would list features relating to both the abstract and concrete sense of gender. So we expected early and frequent listing of features of gender as a social construct (e.g., culture, masculinity, femininity), as well as features related to the more concrete meaning (e.g., sex, body, genitalia).

In addition, we hypothesized that gender is at least in part represented differently depending on the sub-group of interest following the proposal that conceptual knowledge is flexibly modulated by different experiences (Casasanto & Lupyan, 2015). We investigated whether participants that differed in their gender identity listed different features of the concept gender. Additionally, we expected "normative" and heteronormative individuals, which typically conform to the gender-binary system (Motschenbacher, 2019), to produce more features focusing on physical, sexual and biological aspects of gender, while "non-normative" and non-heteronormative (i.e. homosexual) participants would generate more features related to their personal experiences and to the social sense of gender.

2. Method

2.1. Participants

80 native Italian speakers voluntarily took part in the study. Ethical approval was provided by the Ethics Committee of the Institute of Cognitive Sciences and Technologies of the Italian National Research Center (ISTC-CNR Ethical Approval n.0000315). Participants were asked to provide their birth sex, self-identified gender identity, and sexual orientation (details of

procedure below). The majority of individuals were highly educated: 67.5% had a Master Degree and 13.7% had a PhD; 17.5% completed High School, while only 1.2% had Lower High School education.

2.2. Procedure

We created an on-line questionnaire divided into three sections that participants filled in a fixed order. In the first section, participants gave basic personal information, such as age and birth sex (male; female; intersex). The second section consisted of the free-listing task. Participants were asked to provide 10 concepts they thought were related to the concept of gender (*Il tuo compito ora è quello di scrivere dieci concetti che ti vengono in mente in relazione al concetto di genere*; 'Your task is now to type ten concepts that come to your mind related to the concept of gender').

Finally, in the third section, participants provided additional information about their self-identified gender identity, sexual orientation and level of education. Gender identity was assessed through forced-choice boxes (man, woman, queer, and transgender), in addition to a blank text box labeled "other" that participants could fill according to their preferences. Keeping birth sex separate from gender identity allowed participants to report their affirmed gender identity, thus avoiding mis-gendering practices (see Ansara & Hegarty, 2014). Indeed, inferring gender identity from biological sex has been criticized by some scholars, in that self-determined gender identity does not always match with the sex assigned at birth. However, we made this distinction explicit only in the third section of the questionnaire, to avoid potential demand effects. Sexual orientation was assessed through the Kinsey Scale (Kinsey et al., 1948), a self-report measure where participants respond on a 7-point scale, ranging from "exclusively heterosexual" to "exclusively homosexual"—hence not considering sexual behavior a strict dichotomy (although for criticism see Galupo, Mitchell & Davis, 2018, Savin-Williams, 2016).

3. Results

We sought to provide a sketch of how individuals conceptualize gender, in particular in relation to their personal experiences related to gender. As a first step, we report the characteristics of our participants. We then focus on the free-listing data and aggregate results across all participants to illustrate which words were produced more frequently overall. We show how words produced by the full cohort of participants tested are clustered together using a measure which accounts for the psychological saliency of the produced associates (see the following sections for details). This overall analysis is followed by subsidiary analyses zooming in on the free-listing produced by different sub-groups.

3.1. Participant Characteristics

The total sample of participants was 43.7% male (*n*=35; age *M* = 32.7; *SD*=10.5), 56.2% female (*n*=45; age *M* = 29.5; *SD*=7.7), and 0% intersex. Among those individuals, 40% identified themselves as men (*n*=32; age *M* = 33.3; *SD*=11.5), 51.2% identified as women (*n*=41; age *M* = 29.5; *SD*=6.8), 8.7% identified as queer (*n*=7; age *M* = 28.1; *SD*=6.7), and 0% as transgender.

Sexual orientation was also assessed using the Kinsey Scale (Kinsey et al., 1948; for further details, see *Procedure*). Among the total sample, 46.2% (*n*=36) placed their sexual behavior at the heterosexual extreme of the Kinsey Scale (points 1 and 2), while 47.5% (*n*=37) considered their sexual behavior as homosexual (points 6 and 7 of the Kinsey Scale). 8.9% of participants fell in the middle of the scale (points 3, 4, 5) or defined their sexual orientation as bisexual or asexual (*n*=7). At a more fine-grained level, 62.5% of participants reported to be attracted only by one sex (points 1 and 7), while 37.5% reported to be attracted to more than one sex to different extents (points 2, 3, 4, 5, 6).

In order to explore how these differences relate to the concept of *genere* 'gender', participants were first divided into two groups according to their affirmed gender identity (man and women). Individuals who identified as queer were excluded from the analysis by gender

identity because of the small sample size; however, their responses were collated in the subsequent analyses by "normativity", thus partially avoiding the potential marginalization of underrepresented gender and sexual minorities.

Second, participants were divided according to their sexual orientation according to their ratings on the Kinsey Scale. Participants' responses followed a bimodal distribution. Accordingly, participants who scored 1 or 2 in the Kinsey Scale were considered heterosexual, while those who scored 6 or 7 were considered homosexual for the purposes of the analyses by sexual orientation. The remaining participants who rated their sexual orientation on the Kinsey Scale as 3, 4 or 5, or bisexual and asexual were excluded from this analysis, but they were included in the subsequent analyses.

Finally, to distinguish "normative" vs. "non-normative" individuals, we took into account participants' gender identity, sexual orientation, and the correspondence between birth sex and affirmed gender identity. "Normative" individuals (*n*=43) are therefore cis-gender monosexual individuals (either exclusively heterosexual or exclusively homosexual; see e.g. Galupo, Lomash & Mitchell, 2017; Jacobson & Joel, 2019); "non-normative" individuals (*n*=37) are gender-diverse individuals, individuals falling under the umbrella term of transgender, and/or cis-gender individuals who did not define their sexual preferences in strictly monosexual terms (see Motschenbacher, 2019).

3.2. Free-listing task

3.3. How is the Concept of "Gender" Represented Across all Participants?

Overall, the total sample of 80 participants produced 318 words. There was great variation in the responses provided by participants suggesting that, as expected, *genere* 'gender' is a complex concept incorporating a number of distinct components and different experiences. Participants produced a small number of common associates: out of 318 words, 64.7% (*n*= 206) were produced only once by an individual. The most frequently listed word (*identity*), was

produced by 23 out of a total sample of 80 participants. So there is low overall coherence of this category in this sample. For the overall analysis presented first, we focus on associates produced by at least 5% of all participants.

Words with either a strong physical and perceptual connotation (e.g., *sex, sexuality, male* and *female, body*), or related to social and cultural experiences (e.g., *discrimination, stereotype, fluidity, feminism, binarism, queer, rights* and *role*) were the most frequently produced. Experiential and personal features appeared too (e.g., *education, identity, discrimination, identification*), as well as linguistic associations connected to the term *genere* in Italian (e.g., *music, literature, grammar, type*). See below for further details.

3.3.1. Measure of psychological proximity. To analyze the free-listing data in more depth, we used a measure developed by Crowe and Prescott (2003). According to this measure, similarity between pairs of items in a free-listing task can be calculated by considering both the distance of two items produced in a single list (from an individual participant), and the distance of the same two items produced across lists (across participants). The measure is given by two component measures, namely α and β_w, one based on within-list proximity (α), and the other on across-list item co-occurrence (β_w). These two metrics are combined to form the overall inter-item similarity metric ($\alpha\beta_w$). Matrices of inter-item dissimilarity were computed initially for all the participants, and then for all the groups of interest (for further details see Crowe & Prescott, 2003). Once the most frequently produced words were identified, both for the total sample of participants and for the sub-groups of interest, associate words were subjected to cluster analyses based on inter-item dissimilarity matrices described above. The data were analyzed using RStudio (version 1.1.447; R-Core Team, 2017) and R's packages "NbClust" (Charrad, Ghazzali, Boiteau & Niknafs, 2014) and "dendextend" (Galili, 2015).

3.3.2. Clustering methods and analyses. Before applying specific clustering methods, we assessed whether our data could be clustered using Hopkins' statistic test (Lawson and Jurs,

1990), which measures the probability that a given data set is generated by a uniform data distribution. Results show our data do not support strong clustering but approach a good tendency (*H*= 0.45). Hierarchical cluster analysis was performed based on the dissimilarity matrix using Ward's method, based on a sum-of-squares criterion (Murtagh & Legendre, 2014) which minimizes within group dispersion (see also Harpaintner et al., 2018). In order to determine the number of clusters and assess cluster validity, we relied on indexes that are most frequently used in the literature. We thus computed Silhouette Index, C-Index, McClain Index and Dunn Index. Two of the aforementioned indices provided a six-cluster solution (SI= 0.3; CI= 0.3), while the remaining two suggested a two-cluster solution (McClain= 0.5; Dunn=0.06). We opted for the six-cluster solution (Figure 1), which better illustrates the fine-grained structure of 'gender'. The outcome is represented in the dendrogram as visual proximity of words; namely, words that appear clustered together are words that were most frequently produced in succession.
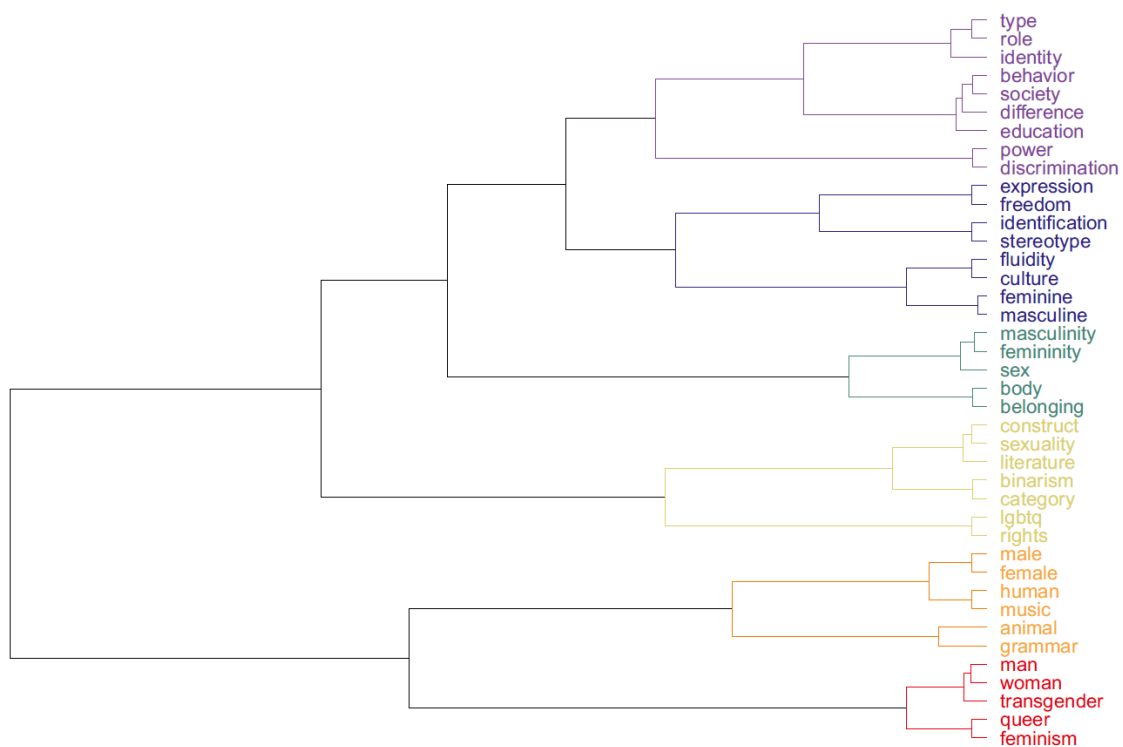
Figure 1. Dendrogram representing the six-clusters solution for words produced by at least 5% of participants.

From top to bottom of Figure 1, we find in cluster 1 (violet) features consistent with the conceptualization of gender as a social construct. Three words are clustered in proximity: *type, role* and *identity*, marking the sense of gender as an identity characteristic based on conventionally recognizable traits. The fact that terms such as *education, difference* and *discrimination* are mentioned closely together reflects the relation that exists in people's minds between education and the development of a gendered identity (for a review see e.g., Fausto-Sterling, 2012), and it points to the personal valence of the concept of gender. This is in line with the notion of *socialization* (e.g., Witt, 1997), according to which parents and peers play a fundamental role in the development of gender-stereotyped self-concepts in children, by reproducing and projecting culturally derived behaviors and norms.

In cluster 2 (blue), features related to the expression and configuration of gender embedded in social and cultural processes are visible. Thus, words such as *expression*, *freedom*, *identification* and *stereotype* cluster together, and connect to *fluidity*, *culture* and the two poles of *masculine* and *feminine*. It is interesting to note that both *masculine* and *feminine* appear in this cluster, consistent with the idea that gendered identities and configurations are interactionally emergent and socially contingent. Interestingly, culture seems to mediate what is considered as masculine and feminine, as confirmed by the proximity between the word *fluidity* and the word *culture*.

In cluster 3 (green) features related to the physical, perceptual, and interoceptive characteristics of gender are present. Words in this set refer to the physical display of gender attitudes (*masculinity* and *femininity*), clustered together with *sex*; *body* and *belonging* are linked together. Compared to the first two clusters, this cluster can be considered as the most traditionally "concrete" one in the sense that it relies more on perceptual and physical properties.

In cluster 4 (yellow) gender is a specifically cultural discourse. This is suggested by the presence of *sexuality* and *construct* (e.g., Foucault, 1978, Motschenbacher, 2019), and by the strong associations of the words *binarism* and *category*, and *rights* and *lgbtq*. This cluster includes concepts generally used in philosophical and political discourses on gender, and it reveals the most "abstract" component of the term derived from a shared knowledge and mediated by cultural and social factors.

In cluster 5 (orange) a different meaning of the Italian word *genere* appears. We find words referring to the meaning of 'genre' (*music*), as well as 'kind', 'species' (*animal*, *human*). In addition, this cluster includes the two Italian grammatical genders *male* and *female*, likely linguistic associations given that they are clustered closely together with the word *grammar*.

In cluster 6 (red) terms relating and challenging the normative facet of gender appear. Interestingly, four gender identities or configurations (*man*, *woman*, *queer* and *transgender*) are closely mentioned with the word *feminism*, and not with words such as *body* or *sex*.

Overall, our results suggest the concept of gender cannot be considered either a purely abstract or a purely concrete concept. Rather, it encompasses aspects traditionally considered to be both abstract and concrete. Linguistic associations (e.g., Paivio, 1986) such as *literature* and *animal*, experiential and situational features like *identification* and *behavior* (e.g., Barsalou & Wiemer-Hastings, 2005), social and contextual features like *binarism* and *queer* (Roversi et al., 2013), and bodily or biological properties (e.g., *male* and *female*) appear. This result is in line with recent perspectives on abstract conceptual knowledge (e.g., Barsalou et al., 2018; Borghi et al., 2018a) and with contemporary debates reconsidering the distinction between the concepts of sex and gender (e.g., van Anders, 2015).

3.4. Does the Concept of "Gender" Vary Across Sub-Groups?

In the analysis presented so far, we do not distinguish people by gender identity, sexual orientation, or according to gender and sexual norms. However, these aspects are likely to

influence the conceptualization of gender. To assess this, participants were divided into three subgroups according to their gender identity (man, woman), sexual orientation (heterosexual, homosexual), and "normativity" ("normative", "non-normative") (see section *3.1. Participant Characteristics*). For each of these sub-groups, we examined how people conceptualized *genere* 'gender'. Target words that entered the cluster analysis were items produced by at least by 10% of participants in each sub-group.

   3.4.1. The concept of gender as a function of gender identity. Overall, there was no significant difference, in the total number of items listed by men (*M*= 7.8; *SD*=2.8) and women (*M*=8.9; *SD*=2.7), *t*(71) = -1.61, *p* > .05. The most frequently produced words by men (Panel A) were *masculine* (22% of the sample) and *identity* (19%). For women (Panel B), *identity* was the most frequently listed term (34% of the sample), followed by *sex* (27%). Figure 2 shows the dendrograms resulting from Hierarchical Cluster Analysis (HCA) for each group.
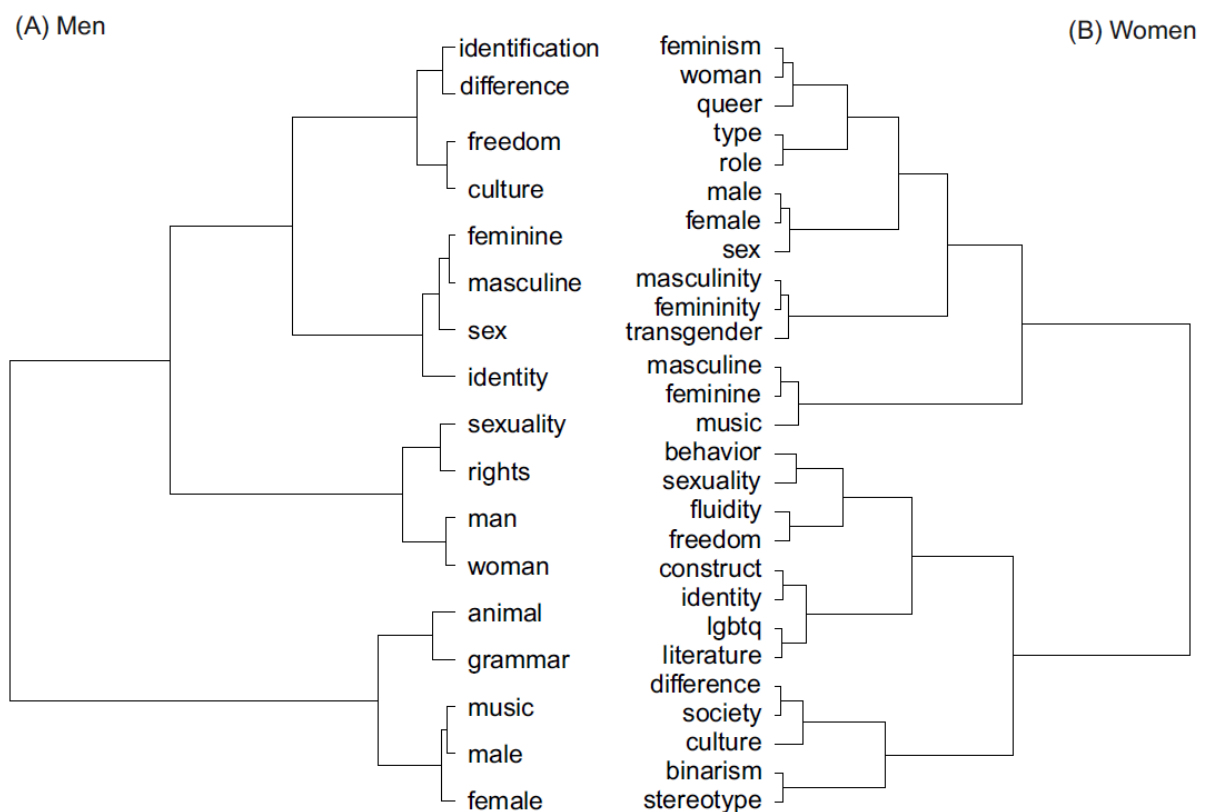
Figure 2. Dendrograms of words produced by at least 10% of (A) men and (B) women.

Even though some words overlapped between the two groups (*n*=12), the cluster analyses showed interesting differences between men and women. For instance, *identity*—one of the most frequently produced term by both groups—was mentioned by men together with *feminine*, *masculine* and *sex*, suggesting a relation between perceptual and physical properties and gender identities. For women, however, *identity* appeared in a heterogeneous cluster consisting of two parts: one stressing experiential features connected with gender (*behavior, sexuality, fluidity* and *freedom*), and another representing more reflective or metacognitive aspects (*construct, identity, lgbtq, literature*), suggesting a non-deterministic perspective on gender identity.

It is also noteworthy that although traditional bigender terms were mentioned by both groups, they are differently positioned in the dendrograms. On the one hand, *male* and *female* are represented in a small biological cluster, linked to *sex*, in the women's dendrogram, which in turn is connected to a more heterogeneous cluster including words conveyed by cultural and linguistic practices (*feminism, queer, role*). In the men's dendrogram, however, the clustering of *male* and *female* reveal a distinct sense of the meaning of *genere*, i.e., related to the English meaning of genre (*animal, grammar, music*). *Masculine* and *feminine* are part of a small linguistic cluster for women (indicated by the presence of the word *music*); for men they are part of a cluster marking the identity-laden value of gender, possibly delimited by sexual differences (*sex*). *Woman* co-occurred with *man* in the men's responses, while in the women's dendrogram the word *woman* was coupled with *feminism* whereas *man* does not appear. *Difference* and *culture* are both part of a socio-cultural cluster in both groups. While men often mentioned them together with *identification* and *freedom*, women generally associated *difference* with *society* in a cluster including *culture, stereotype* and *binarism*.

In sum, there are notable differences between the two groups. Although the conceptualization of gender by men included social and cultural features (e.g., *rights* was mentioned by men, but not women), terms explicitly challenging a binary and heteropatriarchal system were not highly salient: most words referred to the perceptual, biological and physical sphere; for women, social, cultural and experiential features played a more central role. Women mentioned words with social and political value (e.g., *queer*, *feminism*, *construct*, *stereotype*, *fluidity* and *binarism*) consistent perhaps with their social experience of being historically considered a subaltern identity.

3.4.2. The concept of gender as a function of sexual orientation. There was no significant difference in the total number of items listed by heterosexual participants ($M= 8.6$; $SD=2.8$) and homosexual participants ($M= 8.3$; $SD=2.8$), $t(71) = .517$, $p > .05$. *Sex* was the most frequently produced word by the heterosexual group (Panel C) (30% of the sample), followed by *culture* (19%). The homosexual group (Panel D) produced *identity* (39%) and *masculine* (29%) the most frequently. Figure 3 shows the dendrograms resulting from HCA performed on target concepts for each group.
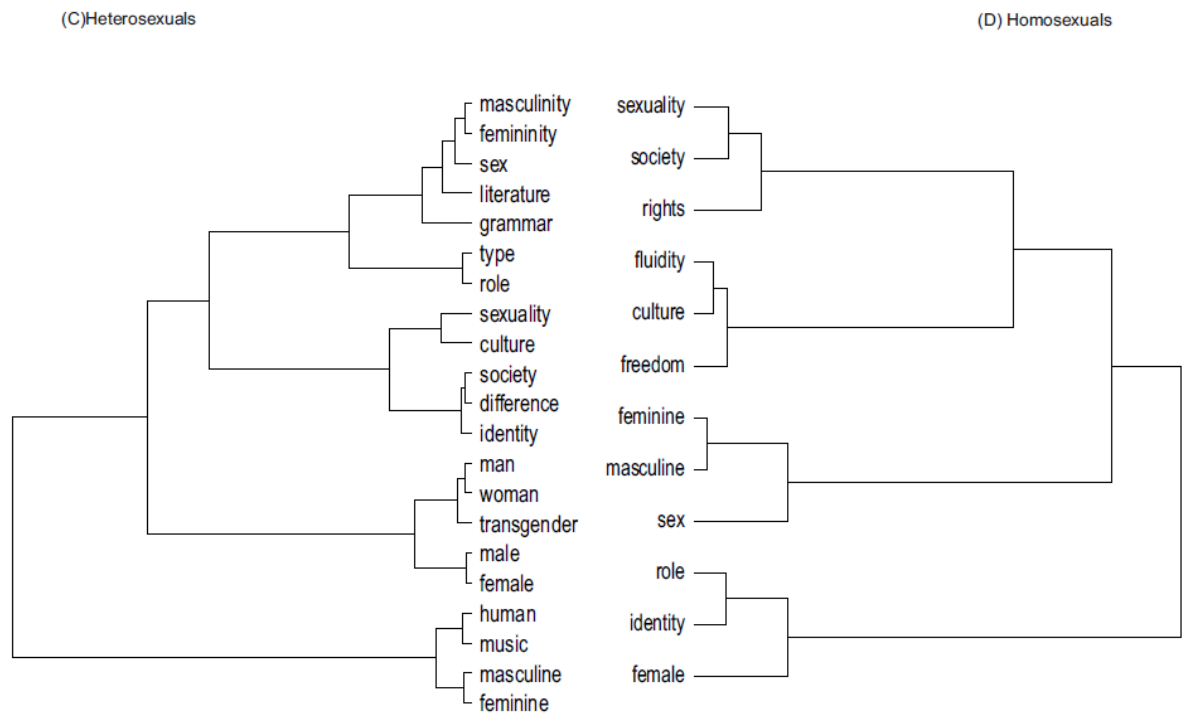
Figure 3. Dendrograms of words produced by at least 10% of (C) heterosexuals and (D) homosexuals.

Even though some words overlapped between the two groups (*n=9*), the cluster analyses showed interesting differences. *Sexuality* and *society* are clustered together by both groups, but the heterosexual group clusters this with general cultural and personal terms (*culture, difference* and *identity*), while in the homosexual group they form a separate and distinct cluster together with *rights*; *culture* is instead in a separate cluster connecting *fluidity* and *freedom*. *Masculine* and *feminine* form a separate small cluster in both groups but they are associated with linguistic features such as *human* and *music* by the heterosexual group, and *sex* by the homosexual group. *Sex* was instead frequently produced together with masculinity and femininity by the heterosexual group, indicating a connection between biological sex and physical appearance.

The clusters in the heterosexual group's dendrogram shows a high prevalence of linguistic associations, along with an attention to the bipolar structure of the term gender (with

the addition of *transgender*). This suggests that one crucial dimension for this group is the biological one that includes the female/male distinction, and the social roles that this distinction carries. The most abstract cluster in this group can be considered a socio-cultural cluster, centered on *culture* and *society,* and encompassing *difference* and *sexuality.* In contrast, for the homosexual group the two most abstract clusters specifically address the political and social value of the term gender: we find here terms such as *rights*, *fluidity* and *freedom*. Interestingly, these are important instances for the LGBTQI community, even in Italy. The fact that they were mainly mentioned by this sub-group suggests that personal experiences and different contexts might shape our conceptual system.

　　3.4.3. The concept of gender as a function of "normativity". There was no significant difference in the total number of items listed by "normative" participants (*M*= 8.7; *SD*= 2.4) and "non-normative" participants (*M*= 8.7; *SD*=3.1), $t(78) = .966$, $p > .05$. The first two most frequently listed words by the "normative" (Panel E) group were *identity* (28%), and *sex* (26%). In the "non-normative" group (Panel F), the most frequently produced words were *identity* (26%) and *culture* (24%). Figure 4 shows the dendrograms resulting from HCA performed on target words for each group.
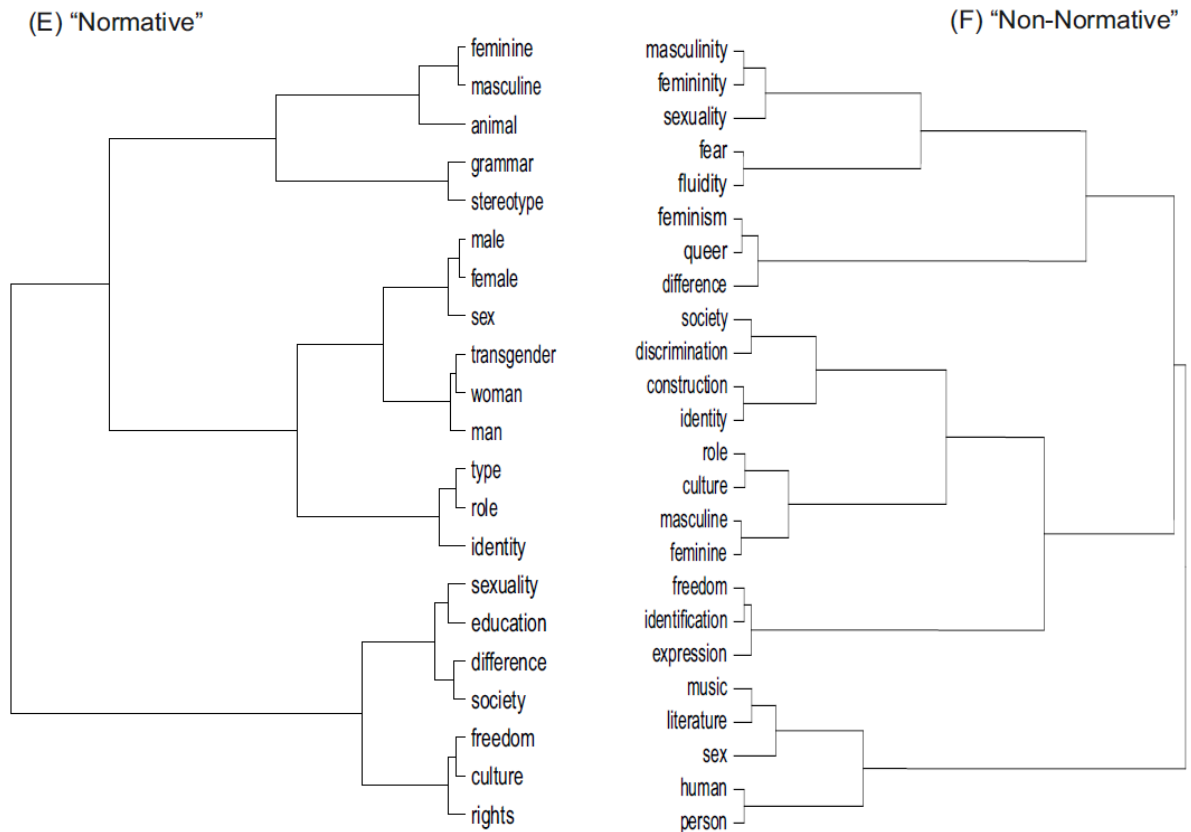
Figure 4. Dendrograms of words produced by at least 10% of (E) "normative" and (F) "non-normative".

Even though some words overlapped between the two groups (*n*=10), the cluster analyses showed interesting differences. *Masculine* and *feminine* were closely related to *animal*, *grammar* and *stereotype* in the "normative" group, in a cluster representing verbal associations (covering three of the five meanings of Italian *genere*); in the "non-normative" group they were instead grouped together with the words *culture* and *role*, in a cluster evoking the idea of traditional gendered roles as social and cultural constructions. *Society* was mentioned mainly with the word *difference*, *sexuality* and *education* in the "normative" group, in a cluster that can be labeled as socio-cultural. In the "non-normative" group, *society* is also included in a cluster that represents the concept of gender as a social construct. In fact, the term *society* is frequently mentioned together with *discrimination, construction* and *identity*. *Sex* was produced in association with *male* and *female* in the "normative" group, while it is related to

linguistic associations with the Italian meaning of gender similar to the English *genre*, such as *music* and *literature* in the "non-normative" group.

The words listed by both groups reveal differences in the conceptual representation of gender. The "normative" group frequently mentioned words referring to gender as a bipolar dimension (e.g., *male/female*, *woman/man*). In the "non-normative" group, the experiential and personal domain together with social and cultural aspects emerges more sharply (e.g., *fear*, *discrimination*, *expression*, *construction*, *fluidity*, *queer* and *feminism*). At the broadest level, two main clusters emerge in the "normative" group: one explicitly referring to a binary perspective on gender which can be considered a more "concrete" cluster. The second cluster is a more abstract cluster with words such as *sexuality* paired with *education*, *freedom*, *rights*, *society* and *culture*. On the other hand, in the "non-normative" group the concrete grounding relies mainly on the experiential corporeity of gender (*masculinity* and *femininity* connected to *sexuality*), and is also connected with *queer*. Overall, the "normative" group emphasized a bigenderist perspective of gender, while the "non-normative" group referred to contextually-dependent and social phenomena challenging traditional bigenderist assumptions.

4. General Discussion

Our results demonstrate that the concept of gender is multilayered. According to participants' responses, biological, perceptual and social aspects converge in the conceptual representation of *genere*. When people are asked to produce free associations of the term, both abstract (i.e., social, cultural, and linguistic) and concrete (i.e., physical, biological, and sexual) associations are elicited. Moreover, our findings indicate that the concept of gender is flexible: depending on the characteristics of the individuals, some features of the concept appear more salient than others.

The results do not align well with the traditional view that assumes abstract and concrete concepts are represented distinctly (e.g., Paivio, 1986, Brysbaert et al., 2014), but are more

compatible with the idea of a fuzzy boundary between abstract and concrete concepts (e.g., Barsalou et al., 2018). The concept of gender is particularly illustrative of this haziness. Specifically, experiential, bodily, biological and perceptual features (e.g., *male*, *female*, *body*, *sex*) are combined with social, cultural introspective and linguistic features (e.g., *queer*, *binarism*, *construct*, *feminism*, *rights, fluidity*). In this light, the boundaries of the concept gender seem to be also delineated by "social metacognition" (Shea, 2018; Borghi et al., 2018c), incorporating terms conveyed by specific cultural and social contexts such as academic discussions and public debates.

Our findings also shed light on the debate concerning the distinction between sex and gender. Specifically, our results support the claim that sex and gender are intrinsically entrenched in social context. People's conceptual knowledge of gender seems to incorporate sexual and biological factors implicated in the distinction between genders (e.g., *sex, female, male, body*), as well as aspects related to the performativity of gender (e.g., *femininity, masculinity, role, difference, expression*) which are inevitably embedded in social and cultural norms. As Butler (1993a) has argued the very distinction between sex as the corporeal fact of our existence, and gender as the social conventions shaping traditional masculinity and femininity is questionable, in that the very perception of physical-sexual differences is affected by social conventions. More recently, van Anders (2015) proposed the notion of gender/sex as "an umbrella term for both gender (socialization) and sex (biology, evolution) […] reflects social locations or identities where gender and sex cannot be easily or at all disentangled." (p.1181). So gender/sex is a multidimensional, dynamic and complex construct, reflecting how sex and socio-cultural gender are entwined, and therefore making explicit the "being" and the "doing" of gender at the same time.

According to some proposals conceptual knowledge is affected by cultural, linguistic and social factors (e.g. Boroditsky et al., 2011; Majid et al., 2004; Casasanto, 2009), and

different populations may categorize things differently depending on the language spoken, and on the experiential and cultural environment they live in (Casasanto & Lupyan, 2015). In this vein, we hypothesized that individuals conforming to a "normative" conception of gender would produce more words related to a bigenderist conception, while "non-normative" individuals would rely more on socio-cultural aspects of gender and on their personal experiences. A comprehensive categorization of gender experiences combining instrumental constructs such as the Kinsey Scale and tick-boxes with pre-given answers arguably rely on a cis-genderist and normative approach. We attempted to overcome this limitation by allowing participants to produce their own label for each variable (assigned birth sex, affirmed gender identity and sexual orientation), using a blank text box. In spite of this, we are aware that our operationalization of "normative" and "non-normative" individuals is possibly problematic, in that it is not always an explicit assessment of participants' of themselves, but an experimenter's inference from participants' answers. Nonetheless, in line with recent developments in language and sexuality research (e.g. Motschenbacher, 2019), we aimed at representing how normativity plays a pivotal role in the discursive construction of gender and sexuality. To avoid misconceptions and misgendering phenomena, and to fully account for gender in its full complexity, further research could make different choices for categorizing gender and sexuality experiences (e.g., see new instruments such as TMF Scale, Kachel et al., 2016; Multi-GIQ questionnaire, Joel et al., 2014, or Sexual-Romantic and Gender-Inclusive Scales, Galupo et al., 2017b).

Despite these caveats, we found some interesting differences in how people conceptualize gender. "Normative" individuals were more likely to mention dichotomous terms, while "non-normative" individuals mentioned words related to the social dimension of gender, such as *fluidity, construction*, *queer* and *feminism,* along with terms such as *fear* and *discrimination*—pointing at specific personal experiences. Recent findings investigating

gender identity among non-binary transgender individuals (Galupo et al., 2017a) showed that one central theme in self-descriptions was the notion of *fluidity*, suggesting that gender identity can fluctuate across time. Our results are in line with these findings, showing that the majority of "non-normative" individuals, in contrast to "normative" individuals, mentioned the term *fluidity* in their associations with the term gender, along with terms such as *feminism* and *queer*. In this regard, the inclusion of the term *queer* in the conceptualization of gender of "non-normative" individuals fosters the importance of the social context in the embodiment of specific experiences. Indeed, over history, the term *queer* acquired the power to give visibility and legitimization to a community of individuals not conforming to bigenderist and heteronormative assumptions. In Butler's words (1993b, p. 19) the term *queer* is "a site of collective contestation", hence a term with a high social and political valence but rooted in personal experiences.

This experiential relativism emerged also in our data from the other groups of interest. For example, homosexual individuals mentioned the word *rights* near *society* and *sexuality*, while for the heterosexual group the word *rights* was not a salient feature of the concept of gender. This could be because in Italy LGBTQI rights are still a matter of debate, and these kinds of issues are strictly related to gender expressions and/or gender identity. On the other hand, cis-gender heterosexual individuals are usually less likely to see their rights compromised based on their sexual preferences or gender identity/expression.

To conclude, gender is a complex and multifaceted concept, whose intricacy is not exhausted by simplistic dichotomies between biological qualities of the human body and cultural or social aspects of sex expressions. These features interact at different levels and to different extents, depending also on specific experiences so as to form the representation of the concept of gender.

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[1] "Normative" in this literature refers to the situation where people feel their assigned birth sex is aligned with their affirmed gender identity, and that generally conform to heterosexual norms, or that are not plurisexual (i.e. are sexually attracted by only one sex). Note that the term "normative" is in quotation marks, indicating that the term is applied in a strictly statistical sense, and not as a value-judgement (see Joel et al., 2014).

[2] In Italian the terms sex and gender are frequently used interchangeably. However, there is a growing awareness of the necessity to separate the two terms to account for social phenomena such as gender gaps in salary, gender-based violence, and to bring attention on specific gender non-conforming experiences, mostly due to the efforts of academic and political discourses (LGBTQ and feminist activism).

[3] An illustrative example is provided by some of the statements of Bergoglio on the family, which according to him is composed solely of a union between man and woman. This perspective is shared by the former Family and Disabilities Minister Lorenzo Fontana, who in his first public statement declared that "rainbow families [families headed by gay couples] don't exist" (https://www.dailymail.co.uk/wires/ap/article-5800563/Italy-Right-wing-leader-says-new-govt-wont-undo-gay-unions.html). Indeed, in Italy same-sex marriages are not legal: civil unions between same sex partners are regulated by a law enacted in 2016 as a special social formation.