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Gender is a multifaceted concept:

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Evidence that specific life experiences differentially shape the concept of gender

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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., 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.

44
45 **1. Introduction**

46   Categories and concepts are what allow us to coherently make sense of the world: they

47 constitute the "bricks" of thought (Murphy, 2002). Importantly, concepts are said to be flexible

48 representations, re-enacting relevant information about a given category in a specific situation

49 (Kiefer & Barsalou, 2013). A large body of evidence demonstrates that the structure of

50 categories and concepts varies as a function of context, both if considered as the physical

51 context in which people are asked to judge sentences, and when considering the linguistic

52 context (or frame) in which people produce features of concepts (for a review see Yee &

53 Thompson-Schill, 2016). Even in tasks explicitly addressing semantic access, the activation of

54 salient semantic features generally depends on task conditions and is dynamically tied to

55 context (Lebois, Wilson-Mendenhall & Barsalou, 2015; Borghi & Barsalou, in press). Concepts

56 also show flexibility across individuals and within the same individual over time, and as a

57 function of changing points of view (e.g., Barsalou & Sewell, 1984). The capacity to retrieve

58 different information in different situations for the same concept has been robustly

59 demonstrated with behavioral tasks (e.g., Barsalou, 1987) and through neuroimaging

60 techniques (Hoenig et al., 2008; Wilson-Mendenhall et al., 2011).

61   Together with task context, linguistic and cultural context can also affect categories. As

62 the growing number of studies concerned with linguistic and cultural relativism testifies,

63 concepts of time (Boroditsky et al., 2011), space (Majid et al., 2004), motion (Papafragou,

64 Hubert & Trueswell, 2008), color (Regier & Kay, 2009), odor (Majid et al., 2018), and moral

65 concepts (Casasanto, 2009) are influenced by the linguistic, cultural, social, and experiential

66 environment, demonstrating how variable concepts can be across groups of people in different

67 environments (see Malt & Majid, 2013). In this paper, we examine the role of within-culture

68 variability in conceptual representation as a function of differential life experiences.

69   Specifically, we explore the concept of "gender" probed through a linguistic task as a function

70   of gender identity, sexual orientation, and gender-normativity.

71   In order to uncover conceptual structure, linguistic tasks such as word-associations or

72   feature and property-generation tasks are among the most commonly employed tools (e.g.,

73   McRae et al., 2005). Asking participants to produce properties for a given concept like "truth"

74   (i.e., property-generation task), for example, can shed light on some relevant features of abstract

75   concepts, such as the importance of introspective and experiential relations (e.g., Barsalou &

76   Wiemer-Hastings, 2005), and demonstrate that abstract concepts are characterized by fewer

77   intrinsic properties and more complex situational relations (Wiemer-Hastings & Xu, 2005;

78   Barca, Mazzuca & Borghi, 2017). Given the higher contextual dependency of abstract concepts

79   compared to concrete concepts (Borghi & Binkofski, 2014), their representation might be more

80   flexibly tied to the social context and personal experiences.

81   While traditional theories suggest that abstract and concrete concepts engage different

82   semantic systems (e.g., Paivio, 1986; Brysbaert, Warriner & Kuperman, 2014), recent

83   approaches have begun to reconsider the classic dichotomy between purely "abstract" and

84   purely "concrete" concepts (Borghi et al., 2018a, 2018b, 2019; Barsalou, Dutriaux &

85   Scheepers, 2018). Specifically, in a situated perspective (e.g., Barsalou, 2008), both concrete

86   and abstract concepts include situational and perceptual information, and support goal-oriented

87   actions. In this light, abstract concepts can be considered to be represented in a

88   multidimensional semantic space with regions that partly overlap with the semantic space of

89   concrete concepts (Troche, Crutch & Reilly, 2014; 2017; Binder et al., 2005; Harpaintner,

90   Trumpp & Kiefer, 2018). Abstract concepts also show high intra-class variability (Ghio et al.,

91   2013; Borghi et al., 2018b; Desai et al., 2018). For instance, Roversi, Borghi and Tummolini

92   (2013) compared properties listed for social entities such as "choir" with properties listed for

93   institutional artifacts such as "ownership" in a property-generation task and found that although

94 both classes of concepts could broadly be considered "social", each elicited distinct properties:

95 social entities elicited a higher proportion of contextual features (typical situations, entities, or

96 events that co-occur with the target concept, e.g., "concert" for "choir"), while institutional

97 artifacts elicited normative relations (e.g., "ownership" after one's own death is legally normed

98 by a "testament"). So, some abstract concepts are more linked to linguistic and social

99 experience, while others have a more salient affective and experiential component (Prinz, 2002;

100 2012).

101 More generally, abstract concepts can be considered a heterogeneous class, grounded in

102 multiple systems—including perception, action, and sensori-motor information—just like

103 concrete concepts. In addition, however, abstract concepts are also grounded in language,

104 emotion, and sociality (cf. Borghi et al., 2018a; 2019; Desai, Reilly & van Dam, 2018; Mellem,

105 Jasmin, Peng & Martin, 2016). These grounding mechanisms might contribute to the

106 representation of specific abstract concepts to different extents, an idea we explore in this paper.

107

108 *1.1. Is Gender an Abstract Concept?*

109 Gender is an interesting concept to think about in this context. It can be considered an

110 embodied social concept in which both concrete (i.e., biological factors) and abstract

111 components (related to social interpretations) are relevant. In fact, recent research has proposed

112 the hybrid label "gender/sex" pointing to a rapprochement of biological, physical and

113 perceptual factors with social and cultural factors in the constitution of gendered and sexual

114 identities (van Anders, 2015; Fausto-Sterling, 2019). This contrasts with the traditional

115 distinction between sex as the natural datum of biological sex (hormones, genes, genitalia etc.),

116 and gender as the province of social and cultural practices built upon a supposed sexual

117 dimorphism. The sex-gender distinction dates back to feminist works (e.g., Rubin, 1975) that

118 aimed at opposing the biological determinism at the basis of women's discrimination.

119   Separating sex from gender allowed feminists to argue that gendered traits (Bem, 1974), and

120   more broadly genders (West & Zimmerman, 1987), are at least in part products of social

121   practices (Haslanger, 1995; Risman, 2004). Nonetheless, scholars such as Butler (1990) have

122   made clear that not only "abstract" notions such as gender roles, but also our sexed bodies

123   (Fausto-Sterling, 1993; 2012), are defined by cultural practices and do not exist outside social

124   meanings (Butler, 1993a).

125   Within psychology, gender is perhaps one of the most employed constructs.

126   Psychological research has focused on gender/sex differences relying on a binary gender system

127   that opposes men to women. Specifically, a binary gender system presupposes that "there are

128   two discrete categories into which all individuals can be sorted […] and one's category

129   membership is biologically determined, apparent at birth, stable over time, salient and

130   meaningful to the self, and a host of psychological variables" (Hyde et al., 2019, p. 1). On this

131   basis scientists have attempted to unravel traits and attitudes that distinguish the two categories.

132   By the means of instrumental constructs, such as gender-schematicity (Bem, 1981) or gender-

133   consistency, scholars have tried to explain the degree of gender-congruence of individuals from

134   childhood to adulthood.

135   Another line of research specifically addresses gendered social stereotypes, showing

136   how these implicitly guide people's expectations, judgements, and perception of individual men

137   and women (for a review see Ellemers, 2018). For instance, traits such as assertiveness,

138   competence, warmth, and nurturance are valued differently in relation to men and women;

139   overall, women are more frequently associated with family life, whereas men are associated

140   with career advancement (Greenwald & Banaji, 1995). Importantly, implicit stereotypical

141   gendered knowledge is activated during language processing: comprehension of linguistic

142   information consistent with stereotypical gender-expectations (e.g., feminine pronouns with the

143 role descriptors "nurse") is more fluent than when it is inconsistent (e.g., masculine pronouns

144 with "nurse"; see e.g., Miersky, Majid & Snijders, 2019; Pesciarelli, Scorolli & Cacciari, 2019).

145   Other approaches focus on the influence of grammatical gender in categorization (e.g.,

146 Cubelli et al., 2011). Some of these studies suggest that speakers of gendered languages

147 incorporate gender as a salient feature of entities, even when this is irrelevant (e.g., in the

148 representation of inanimate entities). For example, Spanish and French adults and children tend

149 to assign feminine and masculine voices to objects according to the grammatical gender of the

150 objects in their native languages (Sera et al., 2002), and Spanish and German speakers

151 remember noun-object pairings better when the noun of the object matches the grammatical

152 gender of the object in their language (Boroditsky, Schmidt & Phillips, 2003). A recent

153 systematic review of the literature on grammatical gender and linguistic relativity suggests that

154 grammatical gender effects on thought are task-specific and modulated by several factors

155 (Samuel, Cole & Eacott, 2019).

156 *1.2. Challenges to the Binary Gender System.*

157   While the "bigenderist assumption" dominates the scientific literature, an emerging area

158 of research from cognitive science and biology questions the binary nature of gender (e.g., van

159 Anders, Goldey & Kuo, 2011; Olson, Key & Eaton, 2015; Joel & Fausto-Sterling, 2016;

160 Roughgarden, 2004; Jordan-Young & Rumiati, 2012; Joel, 2016). Notably, although most

161 people are likely cisgender (i.e., people who perceive their assigned birth sex as congruent with

162 their expressed and desired gender identity), individuals whose identities are not confined to

163 the binary gender system (i.e., gender non-conforming, genderqueer, gender-diverse or

164 transgender individuals) have been documented throughout history and across diverse cultures

165 (Herdt, 1993; Devor, 1997). Attention to gender-nonconforming individuals in the

166 psychological sciences is also promoted by the American Psychological Association, which in

167   2015 issued guidelines for best practices with transgender and gender-nonconforming

168   individuals (APA, 2015)

169   Recently some scholars have introduced in their measurements the notion of gender

170   non-conforming or *genderqueer* (i.e., a person rejecting traditional gender categories such as

171   man/woman), and have begun to investigate gender identity without pathologizing gender-

172   diverse individuals (see Hegarty, Ansara & Barker, 2018 for a recent discussion). For example,

173   Galupo, Pulice-Farrow and Ramirez (2017) asked a sample of 197 individuals who self-

174   identified as either gender-variant or agender to describe their gender identities with the aim of

175   investigating what non-binary individuals consider as central features of their gender identity.

176   A thematic analysis of responses showed that fluidity, mixture, and rejection of traditional

177   bipolar dimensions such as femininity and masculinity were key features.

178   Experiences of non-binary feelings were also evident among "normative" individuals in

179   a study by Joel, Tarrasch, Berman, Mukamel and Ziv (2014) with Israeli participants.

180   "Normative"[1] in this literature refers to people who feel their assigned birth sex is aligned with

181   their affirmed gender identity, and that generally conform to heterosexual norms, or people who

182   are not plurisexual (i.e., are sexually attracted by only one sex). Joel and colleagues explored

183   identity using a questionnaire which measured gender identity, gender dysphoria, and gender

184   performance (Multi-GIQ questionnaire, Joel et al., 2014; see also Jacobson & Joel, 2018; 2019)

185   among people who identified as men, women, and queer. They found that among self-identified

186   men and women, over 35% of people reported feeling the "opposite" gender, both genders, or

187   neither. This was especially prevalent in queer individuals, but no significant differences

188   emerged between the three groups suggesting that far from being binary, gender is fluid and

189   multidimensional.

190   To summarize, gender has been investigated from three broad perspectives: (1) in

191   relation to social stereotypes, (2) relating to the representation of grammatical gender in

192 language and thought, and (3) as a characteristic related to the sense of one's own identity.

193 However, it is unclear how lay people conceptualize gender exactly. Is it conceptualized as

194 something related to our physical and biological make-up or better characterized by social

195 practices? Our study examines the concept of gender in Italian speaking participants. The main

196 purpose was to explore people's conceptual representation of gender taking into account

197 specific experiences that might contribute to the shaping of the concept, in particular different

198 experiences associated with gender identity, sexual orientation, and gender-normativity. We

199 ask whether the concept of gender is differentially shaped by each of these gender-related

200 experiences, in a predominantly conservative cultural setting in terms of gender-related issues.

201 *1.3. The Current Study: How do Italian People Conceptualize Gender?*

202 We adopted a common methodology used to investigate conceptual knowledge. We

203 asked a sample of Italian speaking participants to list words they freely associated with the

204 concept of *genere* 'gender'. We conducted the study in Italy which is an interesting context to

205 explore this question because of the specific linguistic and cultural particulars of this

206 community. In the Italian language, *genere* 'gender', is a polysemous word covering five areas

207 of meaning. In addition to the social interpretation of sex$_2$ it also includes: (1) the original Latin

208 notion of "genus" representing what species have in common (e.g., the genus Panthera, within

209 the family Felidae, includes species such as lions and tigers); (2) a notion similar to the English

210 meaning of *kind* or *type*; (3) aesthetic canon—similar to English *genre*—applying to literature

211 as well as to cinema, arts, and music; (4) the grammatical category distinguishing nouns into

212 masculine or feminine classes, also used to differentiate individuals based on biological

213 features. This distinction is not confined to animate entities, but also applies to inanimate

214 entities on the basis of linguistic conventions—e.g., in Italian *philosophy* is feminine and *table*

215 is masculine. This binary dichotomy may have ramifications for the general concept of

216 "gender" too. Indeed, it has been hypothesized that speaking a language that encodes gender in

217 a binary fashion (e.g., Italian, French) may reinforce the conceptualization of gender as a binary

218 system (see Gabriel & Gygax, 2016; Gabriel, Gygax & Kuhn, 2018; Pérez & Tavits, 2019).

219   The concept of gender in Italian is also interesting because of the specific cultural and

220 social context. Italy is a predominantly catholic country, and theological accounts of gender,

221 sexuality, and family politics are very prominent3. In Italian public debate, the English term

222 *gender* is maintained in its English form as a derogatory term. It describes gender and queer

223 studies as based on an "ideology" that undermine the structure of the traditional family (the so-

224 called *ideology of gender*; see e.g., Garbagnoli, 2014; Bernini, 2016).

225   In order to investigate how Italian speakers represent the concept of gender, we used a

226 free-listing paradigm. We were primarily interested in uncovering conceptual structure, and not

227 in assessing participants' explicit attitudes towards gender-related issues. To avoid participants

228 adopting social desirability strategies, we refrained from explicit measures such as

229 questionnaires or scales measuring attitudes towards sexuality or gender-roles. Instead we

230 focused on participants' own conceptual relations, thus opting for an approach more explicit

231 than, for example, IAT (Greenwald, McGhee & Schwartz, 1998). Free-listing tasks, also termed

232 *semantic fluency procedures*, are thought to make explicit the psychological proximity of

233 concepts and words produced in sequence. The general assumption underlying this kind of task

234 is that when a concept is activated in memory it will in turn prime words and concepts which

235 are semantically related or similar to it. This provides an indirect measure of the psychological

236 saliency of concepts (see Crowe & Prescott, 2003).

237   We conducted the free-listing task with a diverse pool of Italian participants that were

238 divided into three subgroups according to their gender identity, sexual orientation, and

239 classification according to normative or bigenderist benchmarks. In line with the idea that

240 abstract concepts are represented as multidimensional constructs (Borghi et al., 2018a; Barsalou

241 et al., 2018), where both embodied and contextual aspects interact, we expected that across all

242   participants we would find evidence of the duality of *genere* 'gender' in Italian, such that

243   participants would list features relating to both the abstract and concrete sense of gender. As

244   such, we expected early and frequent listing of features of gender as a social construct (e.g.,

245   culture, femininity, masculinity), as well as features related to the more concrete meaning (e.g.,

246   sex, body, genitalia).

247   In addition, we hypothesized that gender is at least in part represented differently

248   depending on the sub-group of interest following the proposal that conceptual knowledge is

249   flexibly modulated by different experiences (Casasanto & Lupyan, 2015). We investigated

250   whether participants that differed in their gender identity listed different features of the concept

251   gender. Additionally, we expected "normative" and heteronormative individuals, who typically

252   conform to the gender-binary system (Motschenbacher, 2019), to produce more features

253   focusing on physical, sexual, and biological aspects of gender, while "non-normative" and non-

254   heteronormative (i.e. plurisexual, homosexual) participants would generate more features

255   related to their personal experiences and to the social sense of gender.

256   **2. Method**

257   *2.1. Participants*

258   80 native Italian speakers voluntarily took part in the study. Ethical approval was provided by

259   the Ethics Committee of the Institute of Cognitive Sciences and Technologies of the Italian

260   National Research Center (ISTC-CNR Ethical Approval n.0000315). Participants were asked

261   to provide their birth sex, self-identified gender identity, and sexual orientation (details of

262   procedure below). The majority of individuals were highly educated: 67.5% had a Master

263   Degree and 13.7% had a PhD; 17.5% completed High School, while only 1.2% had Lower High

264   School education.

265   *2.2. Procedure*

266   We created an on-line questionnaire divided into three sections that participants filled

267   in a fixed order. In the first section, participants gave basic personal information, such as age

268   and birth sex (male; female; intersex). The second section consisted of the free-listing task.

269   Participants were asked to provide 10 concepts they thought were related to the concept of

270   gender (*Il tuo compito ora è quello di scrivere dieci concetti che ti vengono in mente in*

271   *relazione al concetto di genere*; 'Your task is now to type ten concepts that come to your mind

272   related to the concept of gender').

273   Finally, in the third section, participants provided additional information about their

274   self-identified gender identity, sexual orientation, and level of education. Gender identity was

275   assessed through forced-choice boxes (woman, man, queer, and transgender), in addition to a

276   blank text box labeled "other" that participants could fill according to their preferences.

277   Keeping birth sex separate from gender identity allowed participants to report their affirmed

278   gender identity, thus avoiding mis-gendering practices (see Ansara & Hegarty, 2014). Indeed,

279   inferring gender identity from biological sex has been criticized by some scholars, in that self-

280   determined gender identity does not always match with the sex assigned at birth. However, we

281   made this distinction explicit only in the third section of the questionnaire, to avoid potential

282   demand effects. Sexual orientation was assessed through the Kinsey Scale (Kinsey et al., 1948),

283   a self-report measure where participants respond on a 7-point scale, ranging from "exclusively

284   heterosexual" to "exclusively homosexual"—hence not considering sexual behavior a strict

285   dichotomy (although for criticism see Galupo, Mitchell & Davis, 2018, Savin-Williams, 2016).

286   **3. Results**

287   We sought to investigate how individuals conceptualize gender, in particular in relation to their

288   personal experiences related to gender. As a first step, we report the characteristics of our

289   participants. We then focus on the free-listing data and aggregate results across all participants

290   to illustrate which words were produced more frequently overall. We show how words

291 produced by the full cohort of participants tested are clustered together using a measure which

292 accounts for the psychological saliency of the produced associates (see the following sections

293 for details). This overall analysis is followed by subsidiary analyses zooming in on the free-

294 listing produced by different sub-groups according to gender-related experiences. All data and

295 scripts are available at https://osf.io/3zdsm/.

296 *3.1. Participant Characteristics*

297   There were a total of 80 participants, with 45 female (age $M = 29.5$; $SD=7.7$), 35 male

298 (age $M = 32.7$; $SD=10.5$), and no intersex individuals. Among these, 41 identified as women

299 (age $M = 29.5$; $SD=6.8$), 32 identified themselves as men (age $M = 33.3$; $SD=11.5$), 7 identified

300 as queer (age $M = 28.1$; $SD=6.7$), and none as transgender.

301   Sexual orientation was assessed using the Kinsey Scale (Kinsey et al., 1948; for further

302 details, see *Procedure*). Among the total sample, 36 placed their sexual behavior at the

303 heterosexual extreme of the Kinsey Scale (points 1 and 2), while 37 considered their sexual

304 behavior as homosexual (points 6 and 7 of the Kinsey Scale). Seven participants fell in the

305 middle of the scale (points 3, 4, 5) or defined their sexual orientation as bisexual or asexual. At

306 a more fine-grained level, 50 participants reported to be attracted only by one sex (points 1 and

307 7), while 29 participants reported to be attracted to more than one sex to different extents (points

308 2, 3, 4, 5, 6), and one participant identified as asexual.

309   In order to explore how these differences relate to the concept of *genere* 'gender',

310 participants were first divided into two groups according to their self-affirmed gender identity

311 (woman and man). Individuals who identified as queer ($n=7$) were excluded from the analysis

312 by gender identity because of the small sample size; however, their responses were collated in

313 the subsequent analyses by "normativity", thus partially avoiding the potential marginalization

314 of underrepresented gender and sexual minorities.

315   Second, participants were divided according to their sexual orientation according to

316   their ratings on the Kinsey Scale. Participants' responses followed a bimodal distribution.

317   Accordingly, participants who scored 1 or 2 in the Kinsey Scale were considered heterosexual,

318   while those who scored 6 or 7 were considered homosexual for the purposes of the analyses by

319   sexual orientation. The remaining participants who rated their sexual orientation on the Kinsey

320   Scale as 3, 4 or 5, or bisexual and asexual were excluded from this analysis (*n*=7), but they were

321   included in the subsequent analyses.

322   Finally, to distinguish "normative" vs. "non-normative" individuals, we took into

323   account participants' gender identity, sexual orientation, and the correspondence between birth

324   sex and affirmed gender identity. "Normative" individuals (*n*=43) are therefore cis-gender

325   monosexual individuals (either exclusively heterosexual or exclusively homosexual; see e.g.

326   Galupo, Lomash & Mitchell, 2017; Jacobson & Joel, 2019); "non-normative" individuals

327   (*n*=37) are gender-diverse individuals, individuals falling under the umbrella term of

328   transgender, and/or cis-gender individuals who did not define their sexual preferences in strictly

329   monosexual terms. We included exclusively-homosexual cis-gender individuals (point 7 of the

330   Kinsey Scale) in the category of "normative" individuals (Motschenbacher, 2019). In fact, non-

331   exclusively monosexual individuals (points 2, 3, 4, 5, 6 of the Kinsey Scale) can be considered

332   as "less normative" than cis-gender exclusively homosexual individuals, in that their sexual

333   experiences challenge the assumption that sexual interests are only defined by sexual biological

334   features in a binary fashion (see also Hegarty, Ansara & Baker, 2018; van Anders, 2015).

335   *3.2. Free-listing task*

336   *3.3. How is the Concept of "Gender" Represented Across all Participants?*

337   Overall, the total sample of 80 participants produced 300 words. There was great

338   variation in the responses provided by participants suggesting that, as expected, *genere* 'gender'

339   is a complex concept that incorporates a number of distinct components. Participants produced

340 a small number of common associates: out of 300 words, 64% (*n*= 192) were produced only

341 once by an individual. The most frequently listed word (*identity*), was produced by 24 out of a

342 total sample of 80 participants. So, there is low overall coherence of this category in this sample.

343 For the overall analysis presented first, we focus on associates produced by at least 5% of all

344 participants. Among the list of terms produced by all participants, 41 were produced by at least

345 5% of the sample. As would be expected, the data exhibit a power law distribution with the

346 frequency of words inversely proportional to their rank (cf. Zipf, 1935).

347 In order to address our first hypothesis, namely that 'gender' encompasses both abstract

348 and concrete components, we asked an independent sample of 20 Italian participants (9 female,

349 10 male, 1 intersex; M_{age}= 28.1, *SD*= 6.4) to rate on a 7-point scale the most commonly

350 produced associates in terms of abstractness, concreteness, and emotionality. In line with recent

351 research (Villani et al., 2019; Della Rosa et al., 2010), we probed abstractness and concreteness

352 separately. The order of presentation of the words and of the scales was randomized across

353 participants.

354 All data were analyzed using R (version 3.6.2, R-Core Team, 2019) and RStudio

355 (version 1.2.1335; RStudio Team, 2018); data processing was also carried out in part using

356 "dplyr" (Wickham, François, Henry & Müller, 2020), "tidyverse" (Wickham et al., 2019),

357 "broom" (Robinson & Hayes, 2020), and "emmeans" (Lenth, 2020) packages.

358

359 [PLEASE INSERT TABLE 1 HERE]

360

361 As hypothesized, participants in the free-listing task produced terms that included

362 abstract and concrete associates (see Table 1). Overall, the ratings of the free-listing associates

363 demonstrated a negative correlation between abstractness and concreteness ratings, *r*(39)= -

364 0.88, *p*<.001, as would be expected. Concreteness and emotionality ratings were positively

365   correlated, $r(39)= 0.34$, $p=.028$; but there was no significant correlation between abstractness

366   and emotionality ratings, $r(39)= -0.08$, $p= .587$. Generally, the terms produced varied widely in

367   ratings for all three dimensions considered: abstractness ratings ranged from scores of 1.60–

368   5.15 ($M = 3.83$, $SD = 0.92$); concreteness ratings ranged from 2.50–5.75 ($M = 3.93$, $SD = 0.70$);

369   and emotionality ratings ranged from 1.90–5.60 ($M = 3.71$, $SD = 0.90$). One could wonder

370   whether terms produced early in the free-listing differed from those produced later. Perhaps

371   early associates are more likely to be abstract, or conversely more likely to be concrete. We

372   found no significant difference among the first 20 terms produced and the last 20 produced in

373   abstractness, $t(39)= -0.52$, $p= .600$; concreteness, $t(39)= 0.45$, $p= .649$; or emotionality, $t(39)=$

374   1.04, $p= .300$. This suggests abstract and concrete associates are equally distributed across the

375   free-listing exemplar production of 'gender'.

376   To facilitate further qualitative interpretation, we computed an abstractness–

377   concreteness difference score by subtracting the mean abstractness rating for each item from

378   the mean concreteness rating. Terms with a resulting positive value can be considered abstract

379   words, and those with negative values concrete words (see Table 1). Among the 41 most

380   frequently produced terms, 23 were abstract and 18 were concrete.

381

382   The free-listing data revealed associates with concrete physical and perceptual

383   connotations, (e.g., *body, woman, female, man, male, sex*), as well as abstract social and cultural

384   experiences (e.g., *construct, freedom, category, fluidity*). Additional terms included experiential

385   and personal features (e.g., *education, identity, discrimination, identification*), as well as

386   linguistic associations connected to the term *genere* in Italian (e.g., *music, literature, grammar,*

387   *type*).

388   *3.3.1. Measure of psychological proximity*. To analyze the free-listing data in more

389   depth, we used a measure developed by Crowe and Prescott (2003). According to this measure,

390   similarity between pairs of items in a free-listing task can be calculated by considering both the

391   distance of two items produced in a single list (from an individual participant), and the distance

392   of the same two items produced across lists (across participants). The measure is given by two

393   component measures, namely α and β_w, one based on within-list proximity (α), and the other

394   on across-list item co-occurrence (β_w). These two metrics are combined to form the overall

395   inter-item similarity metric ($\alpha\beta_w$). Matrices of inter-item dissimilarity were computed initially

396   for all the participants, and then for all the groups of interest (for further details see Crowe &

397   Prescott, 2003). Once the most frequently produced words were identified, both for the total

398   sample of participants and for the sub-groups of interest, associate words were subjected to

399   cluster analyses based on inter-item dissimilarity matrices described above. Hopkins' statistic

400   test has been performed using the package "factoextra" (Kassambara & Mundt, 2017).

401   Clustering indices were calculated with the "NbClust" package (Charrad, Ghazzali, Boiteau &

402   Niknafs, 2014), and dendrograms produced using "dendextend" package (Galili, 2015).

403   *3.3.2. Clustering methods and analyses*. Before applying specific clustering methods,

404   we assessed whether our data could be clustered using Hopkins' statistic test (Lawson and Jurs,

405   1990), which measures the probability that a given data set is generated by a uniform data

406   distribution. The results indicated our data approach a good tendency (*H*= 0.53). Hierarchical

407   cluster analysis was performed based on the dissimilarity matrix using Ward's method, based

408   on a sum-of-squares criterion (Murtagh & Legendre, 2014) which minimizes within group

409   dispersion (see also Harpaintner et al., 2018). In order to determine the number of clusters and

410   assess cluster validity, we relied on indices that are most frequently used in the literature. We

411   thus computed Silhouette Index, C-Index, McClain Index and Dunn Index. Two of the

412   aforementioned indices provided a six-cluster solution (SI= 0.3; CI= 0.3), while the remaining

413   two suggested a two-cluster solution (McClain= 0.3; Dunn=0.06). We opted for the six-cluster

414   solution (Figure 1), which better illustrates the fine-grained structure of *genere* 'gender'. The

415   outcome is represented in the dendrogram as visual proximity of words; namely, words that

416   appear clustered together by short branch lengths are words that were most frequently produced

417   in succession.

418   We found there was no difference across clusters in abstractness ratings, $F(5, 35)= 1.78$,

419     $p=0.142$, or concreteness ratings, $F(5, 35)= 2.13$, $p=.084$, but there was a significant difference

420   in emotionality rating $F(5, 35)= 3.43$, $p=.012$. Pairwise comparisons showed Cluster 1 was

421   rated as more emotional than Cluster 2, $t(35)= 3.92$, $p= .004$, but there were no other significant

422   differences.

423

424   [PLEASE INSERT FIGURE 1 HERE]

425

426   We refer to the clusters in Figure 1 from top to bottom. In the top cluster—Cluster 1

427   (violet)—and the next Cluster 2 (blue) the terms are consistent with the conceptualization of

428   gender as a social construct. These two clusters represent the most abstract part of the

429   dendrogram, and point to the idea of gender as a social construction (Butler, 1990), entrenched

430   in social structures (e.g., *power*, *discrimination*; Foucault, 1978). Cluster 1 had a large number

431   of words that were rated as highly emotional (*expression, freedom, power, and discrimination*).

432   In Cluster 2 all the words were rated as abstract (*construct* is the most abstract term in

433   the list, see Table 1). This cluster includes concepts generally used in philosophical and political

434   discourses on gender, and it reveals aspects of the conceptualization of gender derived from

435   shared knowledge and mediated by cultural and social factors (see Shea, 2018).

436   In Cluster 3 (green) features related to the physical, perceptual, and interoceptive

437   characteristics of gender are evident. Words in this set refer to the physical display of gender

438   attitudes (*masculinity* and *femininity*), clustered together with *sex*; *body* and *belonging* are

439   linked together. In this cluster abstract terms (*belonging*, *femininity*, and *masculinity*) are

440 combined with the most concrete term listed (*body*; see Table 1), suggesting that this cluster is

441 a mix of interoceptive features and physical and perceptual ones.

442   Cluster 4 (yellow) points to gender as a specifically cultural and social discourse. This

443 is suggested by the presence of *sexuality, politics, feminism* and *queer* (e.g., Foucault, 1978,

444 Motschenbacher, 2019; Butler, 1993b), and by the strong associations of the words *rights* and

445 *lgbtq*.

446   Cluster 5 (orange) is the most heterogeneous cluster. Here, terms relating and

447 challenging the normative facet of gender (*transgender*, *fluidity*) appear as closely linked to

448 social and cultural terms (*culture*, *education*, *difference*, *society*, and *behavior*) and terms

449 indicating identity-related characteristics (*feminine*, *masculine* and *identity*). This is likely to

450 reflect the relation that exists in people's minds between education and the development of a

451 gendered identity (for a review, see e.g., Fausto-Sterling, 2012), and it is in line with the notion

452 of *socialization* (e.g., Witt, 1997), according to which parents and peers play a fundamental

453 role in the development of gender-stereotyped self-concepts in children, by reproducing and

454 projecting culturally derived behaviors and norms.

455   In Cluster 6 (red) a different meaning of the Italian word *genere* appears. We find words

456 referring to the meaning of 'genre' (*music*), as well as 'kind', 'species' (*animal*, *human*) and

457 *grammar*. In addition, this cluster includes *male* and *female*, likely linguistic associations given

458 that they are clustered closely together with the words *human* and *music*. This cluster is the

459 most concrete according to the ratings: of a total of 8 words, only two can be considered abstract

460 (*identification* and *stereotype*); all the other words were rated as concrete.

461   Overall, our results suggest the concept of gender cannot be considered either a purely

462 abstract or a purely concrete concept. Rather, it encompasses aspects traditionally considered

463 to be both abstract and concrete. Linguistic associations (e.g., Paivio, 1986) such as *literature*

464 and *animal*, experiential and situational features like *identification* and *behavior* (e.g., Barsalou

465 & Wiemer-Hastings, 2005), social and contextual features like *binarism* and *queer* (Roversi et

466 al., 2013), culturally mediated aspects like *politics* and *feminism* (Shea, 2018), and bodily or

467 biological properties (e.g., *body*, *female* and *male*) appear. This result is in line with recent

468 accounts of abstract conceptual knowledge (e.g., Barsalou, Dutriaux & Scheepers, 2018; Borghi

469 et al., 2018a) and with contemporary debates reconsidering the distinction between sex and

470 gender (e.g., van Anders, 2015).

471 *3.4. Does the Concept of "Gender" Vary Across Sub-Groups?*

472 In the analysis presented so far, we did not distinguish people by gender identity, sexual

473 orientation, or according to gender and sexual norms. However, these aspects are likely to

474 influence the conceptualization of gender. To assess this, participants were divided into three

475 subgroups according to their gender identity (woman, man), sexual orientation (heterosexual,

476 homosexual), and "normativity" ("normative", "non-normative") (see section *3.1. Participant*

477 *Characteristics*). For each of these sub-groups, we examined how people conceptualized

478 *genere* 'gender'. Relevant words that entered the cluster analysis were items produced at least

479 by 10% of participants in each sub-group. In the sub-groups analyses, we raised the threshold

480 for inclusion from 5% to 10% so as to avoid having items produced by only one participant

481 which would have arisen due to the subsetting of the data. Inclusion of unique items would

482 have merely led to more idiosyncratic responses being considered in the analyses, whereas we

483 hope to capture general trends.

484   *3.4.1. The concept of gender as a function of gender identity.* Overall, there was no

485 significant difference in the total number of items listed by women ($M = 8.90$; $SD = 2.71$) and

486 men ($M = 7.84$; $SD = 2.86$), $t(71) = -1.61$, $p = .111$, although women showed higher agreement

487 in the terms they mentioned, with 29 commonly listed words compared to 12 common words

488 produced by the men. Among the terms produced by women, 17 were abstract and 12 concrete.

489 Men produced 8 concrete and 4 abstract terms. Chi-squared tests revealed no difference

490   between the two groups in the number of tokens of abstract and concrete terms, $\chi_2(1) = 1.27$,

491   *p*= .258. Comparing all relevant terms produced by women and men, also revealed no

492   significant difference in abstractness, *t*(39)= 1.85, *p*=.071; concreteness, *t*(39)=-1.82, *p*=.076;

493   or emotionality, *t*(39)= -0.17, *p*=.863. The most frequently produced words by women (Panel

494   A) were *identity* (39% of the sample) and *sex* (27%). For men (Panel B) *masculine* was the

495   most frequently produced word (22%), followed by *identity* (19%). Figure 2 shows the

496   dendrograms resulting from Hierarchical Cluster Analysis (HCA) for each group.

497

498   [PLEASE INSERT FIGURE 2 HERE]

499

500   The data from both groups supported a good clustering tendency (women's *H*= 0.58;

501   men's *H*= 0.69). Even though some words overlapped between the two groups (*n*=9), the cluster

502   analyses revealed differences between men and women too. For instance, *identity*—one of the

503   most frequently produced terms by both groups—was mentioned by men together with

504   *feminine*, *masculine* and *sex*, suggesting a relation between perceptual and physical properties

505   and gender identities. For women, however, *identity* appeared closely related to social terms

506   (*construct*, *role*, *freedom*) and subsequently connected with *fluidity*, *sex*, *behavior* and *society*,

507   suggesting a non-deterministic perspective on gender identity.

508   It is also noteworthy that although traditional bigender terms were mentioned by both

509   groups, they are differently positioned in the dendrograms. On the one hand, *male* and *female*

510   are represented in a small biological cluster, in the women's dendrogram, which in turn is

511   connected to words that seem to challenge a traditional binary conception of gender

512   (*transgender*). In the men's dendrogram, however, the clustering of *male* and *female* appears

513   as a linguistic association to the grammatical category of gender, as indicated by the link

514   between the two terms and the word *grammar*. *Masculine* and *feminine* are part of a small

515 linguistic cluster for women (indicated by the presence of the word *music*); for men they are

516 part of a cluster marking the identity-laden value of gender, possibly delimited by sexual

517 differences (*sex*). *Woman* co-occurred with *man* in the men's responses, while in the women's

518 dendrogram the word *woman* was coupled with *feminism* along with *difference* and *queer,*

519 whereas *man* does not appear. *Difference* and *culture* are both part of a socio-cultural cluster in

520 both groups. While women generally associated *culture* with *sexuality* in a cluster including

521 *masculinity* and *femininity,* men often mentioned them together with *rights* and subsequently

522 *man* and *woman*.

523   In sum, there are notable qualitative differences between the two groups. Although the

524 conceptualization of gender by men included social and cultural features (e.g., *rights* was

525 mentioned by men, but not women), terms explicitly challenging a binary and heteropatriarchal

526 system were not highly salient: most words referred to the perceptual, biological and physical

527 sphere; for women, social, cultural and experiential features played a more central role. Women

528 mentioned words with social and political value (e.g., *queer*, *feminism*, *construct*, *stereotype*,

529 *fluidity* and *binarism*) consistent perhaps with their social experience of historically being

530 considered a subaltern identity. This relates to the notion of "androcentrism", that implies "the

531 privileging of male experience and the "otherizing" of female experience, such that males and

532 male experience are treated as a neutral standard or norm ... and females and female experience

533 are treated as a sex-specific deviation from that allegedly universal standard" (Bem, 1993; p.

534 41; for a recent review see Bailey, LaFrance & Dovidio, 2019).

535   *3.4.2. The concept of gender as a function of sexual orientation.* There was no

536 significant difference in the total number of items listed by heterosexual participants (*M*= 8.64;

537 *SD*=2.83) and homosexual participants (*M*= 8.30; *SD*=2.81), $t(71) = 0.51$, p=.607, although

538 heterosexual participants showed higher agreement in the terms they mentioned, producing 22

539 words in common versus 12 words in the homosexual group. There was no significant

540 difference between the two groups in the number of abstract and concrete terms listed, $\chi^2(1) =$

541 0.75, $p=$ .383, with heterosexual participants listing 8 abstract and 14 concrete terms, and

542 homosexual participants listing 7 abstract and 5 concrete terms. Similarly, comparing all

543 relevant terms, there was no significant difference in abstractness $t(32)=$ -1.10, $p=$.279,

544 concreteness $t(32)=$ 1.10, $p=$.276, or emotionality ratings $t(32)=$ -1.16, $p=$.251, of the terms

545 listed by heterosexual and homosexual participants. *Sex* was the most frequently produced word

546 by the heterosexual group (Panel C) (31% of the sample), followed by *culture* (19%). The

547 homosexual group (Panel D) produced *identity* (41%) and *masculine* (30%) most frequently.

548 Figure 3 shows the dendrograms resulting from HCA performed on target concepts for each

549 group.

550

551   [PLEASE INSERT FIGURE 3 HERE]

552

553   The data from both groups supported a good clustering tendency (heterosexuals' $H=$

554 0.70; homosexuals' $H=$ 0.60). Even though some words overlapped between the two groups

555 ($n=$9), the cluster analyses showed interesting qualitative differences. *Sexuality* forms a separate

556 cluster in both groups, but in the heterosexual group is paired with gendered terms (*man* and

557 *woman*), while in the homosexual group it forms a separate and distinct cluster together with

558 *rights* and *society*; *culture* is instead in a separate cluster connected with *fluidity* and *freedom.*

559 *Masculine* and *feminine* form a separate small cluster in both groups but are associated with

560 linguistic features such as *human* and *music* by the heterosexual group, but with *sex* by the

561 homosexual group. *Sex* was instead frequently produced together with *masculinity* and

562 *femininity* by the heterosexual group, indicating a connection between biological sex and

563 physical appearance.

564   The clusters in the heterosexual group's dendrogram shows a high prevalence of

565   linguistic associations, along with attention to the bipolar structure of the term gender (with the

566   addition of *transgender*). This suggests that one crucial dimension for this group is the

567   biological one that includes the female/male distinction, and the social roles that this distinction

568   carries. The most abstract cluster in this group can be considered a socio-cultural cluster,

569   centered on *culture* and *society,* and encompassing *difference* and *role.* In contrast, for the

570   homosexual group the two most abstract clusters specifically address the political and social

571   value of the term gender: we find here terms such as *rights*, *fluidity* and *freedom*. Interestingly,

572   these are important instances for the LGBTQI community. The fact that they were mainly

573   mentioned by this sub-group suggests that personal experiences and different contexts shape

574   our conceptual system.

575   *3.4.3. The concept of gender as a function of "normativity".* There was no significant

576   difference in the total number of items listed by "normative" participants ($M = 8.77$; $SD = 2.49$)

577   and "non-normative" participants ($M = 8.16$; $SD=3.10$), $t(78) =0 .96$, $p =.337$. There was also

578   no significant difference between the two groups in the number of abstract and concrete terms

579   listed, $\chi_2(1) = 0.11$, $p= .731$, with "normative" participants listing 7 abstract and 10 concrete

580   terms, and "non-normative" participants listing 9 abstract and 8 concrete terms. Similarly,

581   comparing all relevant terms there was no significant difference in ratings of abstractness $t(32)=$

582   -1.24, $p=.222$, concreteness $t(32)= 1.42$, $p=.165$, or emotionality $t(32)= -0.08$, $p=.934$, listed by

583   "normative" and "non-normative" participants.

584   The first two most frequently listed words by the "normative" (Panel E) group were

585   *identity* (30%), and *sex* (26%). In the "non-normative" group (Panel F), the most frequently

586   produced words were *identity* (30%) and *culture* (24%). Figure 4 shows the dendrograms

587   resulting from HCA performed on target words for each group.

588

589   [PLEASE INSERT FIGURE 4 HERE]

590

591   The data from both groups supported a good clustering tendency ("normative" $H= 0.55$;

592   "non-normative" $H= 0.60$). Even though some words overlapped between the two groups

593   ($n=10$), the cluster analyses indicated qualitative differences too. *Masculine* and *feminine*

594   formed a separate cluster in the "normative" group, suggesting the two terms represent a crucial

595   axis along which the concept of gender is organized; in the "non-normative" group they were

596   instead grouped together with the word *expression* and subsequently *sex* and *fluidity*, in a cluster

597   evoking the idea of traditional gendered roles as social and cultural constructions, and

598   suggesting the idea of femininity and masculinity as performative acts (Butler, 1990). *Society*

599   was mentioned mainly with the word *sexuality* and *education,* and then the word *identity* in the

600   "normative" group, in a cluster that can be labeled as socio-cultural. In the "non-normative"

601   group, *society* was also included in a heterogeneous cluster that represents the concept of gender

602   as a social construct. Specifically, the term *society* was frequently mentioned together with

603   *discrimination*. *Sex* was produced in association with *role* and *difference* in the "normative"

604   group, while it was paired with the word *fluidity* in the "non-normative" group.

605   The words listed by both groups reveal differences in the conceptual representation of

606   gender. The "normative" group frequently mentioned words referring to gender in a binary

607   perspective (e.g., *male/female*, *woman/man*). In the "non-normative" group, the experiential

608   and personal domain together with social and cultural aspects emerge more sharply (e.g.,

609   *discrimination*, *expression*, *construct*, *fluidity*, and *queer*). At the broadest level, two main

610   clusters emerged in the "normative" group: one explicitly referring to a binary perspective on

611   gender which can be considered a more "concrete" cluster, composed of the words that were

612   rated as more concrete (*woman*, *man*, *male, female*) with the addition of the word *transgender*.

613   The second cluster is a more abstract cluster including words such as *sexuality, education,*

614   *society, stereotype* and *culture*. In the "non-normative" group, on the other hand, the concrete

615   grounding relies mainly on the experiential corporeity of gender (*masculinity* and *femininity*

616   connected to *expression*), but it is connected with *sex* and *fluidity*. Overall, the "normative"

617   group emphasized a bigenderist perspective of gender, while the "non-normative" group

618   referred to contextually-dependent and social phenomena challenging traditional bigenderist

619   assumptions.

620   **4. General Discussion**

621   Our results demonstrate that the concept of gender is multilayered. According to

622   participants' responses, biological, perceptual and social aspects converge in the conceptual

623   representation of *genere*. When people were asked to produce free associations of the term,

624   both abstract (i.e., social, cultural, and linguistic) and concrete (i.e., physical, biological, and

625   sexual) associations were elicited. Our findings also suggest that the concept of gender is

626   malleable: depending on the characteristics of the individuals, some features of the concept

627   appear more salient than others.

628   The results do not align well with the traditional view that assumes abstract and concrete

629   concepts are represented distinctly (e.g., Paivio, 1986, Brysbaert et al., 2014), but are more

630   compatible with the idea of a fuzzy boundary between abstract and concrete concepts (e.g.,

631   Barsalou, Dutriaux & Scheepers, 2018). We believe the concept of gender is particularly

632   illustrative of this haziness, although future research could specifically address whether and to

633   what extent other abstract concepts are differently represented as a function of personal and

634   cultural experiences. Specifically, in the case of gender, we found experiential, bodily,

635   biological, and perceptual features (e.g., *female*, *male*, *body*, *sex*) were combined with social,

636   cultural, introspective, and linguistic features (e.g., *queer*, *binarism*, *construct*, *feminism*, *rights,*

637   *fluidity, discrimination*). In this light, the boundaries of the concept gender seem to also be

638   delineated by "social metacognition" (Shea, 2018; Borghi et al., 2018c), incorporating terms

639   conveyed by specific cultural and social contexts such as academic discussions and public

640   debates.

641   Our findings shed light on the debate concerning the distinction between sex and gender.

642   Specifically, the results support the claim that sex and gender are entrenched in social context.

643   People's conceptual knowledge of gender seems to incorporate sexual and biological factors

644   related to gender (e.g., *sex, female, male, body*), as well as aspects related to the performativity

645   of gender (e.g., *femininity, masculinity, role, difference, expression*) which are inevitably

646   embedded in social and cultural norms. As Butler (1993a) has argued the very distinction

647   between sex as the corporeal fact of our existence, and gender as the social conventions shaping

648   traditional femininity and masculinity is questionable, in that the perception of physical-sexual

649   differences is affected by social conventions. Indeed, the adequacy of a two-sex system has

650   been questioned as it does not include the full spectrum of human sexual configurations, which

651   might be better characterized as lying on a continuum (see e.g., Fausto-Sterling, 1993). More

652   recently, van Anders (2015) proposed the notion of gender/sex as "an umbrella term for both

653   gender (socialization) and sex (biology, evolution) […] reflects social locations or identities

654   where gender and sex cannot be easily or at all disentangled." (p.1181). Whatever the

655   underlying "reality", we show that gender/sex is conceptualized by Italian people as a

656   multidimensional, dynamic and complex construct, reflecting the fact that sex and socio-

657   cultural gender are entwined, and therefore making explicit the "being" and the "doing" of

658   gender at the same time.

659   According to some proposals conceptual knowledge is affected by cultural, social, and

660   linguistic factors (e.g. Boroditsky et al., 2011; Majid et al., 2004; Casasanto, 2009), and

661   different populations may categorize things differently depending on the language spoken, and

662   on the experiential (Casasanto & Lupyan, 2015) and cultural environment (Majid et al., 2018)

663   they live in. In this vein, we hypothesized that individuals conforming to a "normative"

664 conception of gender would produce more words related to a bigenderist conception, while

665 "non-normative" individuals would rely more on socio-cultural aspects of gender and on their

666 personal experiences. A comprehensive categorization of gender experiences combining

667 instrumental constructs such as the Kinsey Scale and tick-boxes with pre-given answers

668 arguably rely on a cis-genderist and normative approach. We attempted to overcome this

669 limitation by allowing participants to produce their own label for each variable (assigned birth

670 sex, affirmed gender identity, and sexual orientation), using a blank text box. In spite of this,

671 we are aware that our operationalization of "normative" and "non-normative" individuals is

672 possibly problematic, in that it is not always an explicit assessment of participants' of

673 themselves, but an experimenter's inference from participants' answers. Nonetheless, in line

674 with recent language and sexuality research (e.g., Motschenbacher, 2019), we aimed at

675 exploring how normativity plays a role in the discursive construction of gender and sexuality.

676 To avoid misconceptions and misgendering phenomena, and to fully account for gender in its

677 full complexity, further research could make different choices for categorizing gender and

678 sexuality experiences (e.g., see new instruments such as TMF Scale, Kachel et al., 2016; Multi-

679 GIQ questionnaire, Joel et al., 2014, or Sexual-Romantic and Gender-Inclusive Scales, Galupo

680 et al., 2017b).

681 Despite these caveats, we found some interesting differences in how people

682 conceptualize gender. "Normative" individuals were more likely to mention dichotomous

683 terms, while "non-normative" individuals mentioned words related to the social dimension of

684 gender, such as *fluidity, construct*, and *queer,* along with terms such as *expression* and

685 *discrimination*—pointing at specific personal experiences. Recent findings investigating

686 gender identity among non-binary transgender individuals (Galupo et al., 2017a) showed that

687 one central theme in self-descriptions was the notion of *fluidity*, suggesting that gender identity

688 can fluctuate across time. Our results are in line with these findings, showing that the majority

689   of "non-normative" individuals, in contrast to "normative" individuals, mentioned the term

690   *fluidity* in their associations with the term gender, along with terms such as *construct* and *queer*.

691   In this regard, the inclusion of the term *queer* in the conceptualization of gender of "non-

692   normative" individuals supports the importance of the social context in the embodiment of

693   specific experiences. Indeed, over history, the term *queer* acquired the power to give visibility

694   and legitimization to a community of individuals not conforming to bigenderist and

695   heteronormative assumptions. In Butler's words (1993b, p. 19) the term *queer* is "a site of

696   collective contestation", hence a term with a high social and political valence but rooted in

697   personal experiences.

698   It is also worth noting that, our sample of "non-normative" individuals mentioned

699   binary gendered terms such as *feminine* and *masculine* like our "normative" sample. This is in

700   line with findings from Lederer (2019) who analyzed the speech and gesture of transgender

701   individuals. Lederer (2019) found that although one person identified as a-gender, the gestures

702   accompanying the elucidation of the term *a-gender* matched with the conceptual metaphor of

703   gender as two bounded regions delimiting the boundaries between females and males. This

704   suggest that the binary model of gender is so culturally entrenched that even in individuals

705   questioning, rejecting, or moving across a bigendered schema it is still lurking.

706   This experiential relativism emerged also in our data from the other groups of interest.

707   For example, homosexual individuals mentioned the word *rights* near *society* and *sexuality*,

708   while for the heterosexual group the word *rights* was not a salient feature of the concept of

709   gender. This could be because in Italy LGBTQI rights are still a matter of debate, and these

710   kinds of issues are strictly related to gender expression and/or gender identity. On the other

711   hand, cis-gender heterosexual individuals are usually less likely to see their rights compromised

712   based on their sexual preferences or gender identity/expression.

713   To conclude, gender is a complex and multifaceted concept, whose intricacy is not

714 exhausted by simplistic dichotomies between biological qualities of the human body and

715 cultural or social aspects of sex expressions. These features interact at different levels and to

716 different extents, depending also on specific experiences so as to form the representation of the

717 concept of gender.

725

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Table 1

Terms produced by at least 5% of participants (N= 80) ordered according to their frequency, and associated rating scores on emotionality, abstractness, and concreteness. On the difference score, a positive score indicates an abstract concept; negative score indicates a concrete concept.

Word produced by participants in Italian	Translation in English	Percentage of participants producing response (raw frequency)	Emotionality mean rating (standard deviation)	Abstractness mean rating (standard deviation)	Concreteness mean rating (standard deviation)	Difference score abstractness-concreteness
identità	identity	30 (24)	4.6 (1.5)	5.1 (2.0)	4.0 (1.5)	1.1
sesso	sex	22 (18)	4.7 (1.8)	2.8 (1.2)	4.7 (1.7)	-2.0
cultura	culture	19 (15)	4.6 (1.8)	4.5 (1.7)	3.6 (1.5)	0.9
maschile	masculine	19 (15)	2.8 (1.5)	3.5 (1.4)	3.7 (1.1)	-0.2
ruolo	role	16 (13)	3.2 (2.2)	4.1 (1.5)	3.4 (1.8)	0.7
femminile	feminine	16 (13)	3.6 (2.0)	3.4 (1.7)	4.1 (1.4)	-0.7
società	society	15 (12)	3.7 (1.9)	4.2 (2.0)	3.9 (1.7)	0.3
fluidità	fluidity	14 (11)	3.1 (1.8)	4.8 (2.0)	2.5 (1.5)	2.3
transgender	transgender	14 (11)	3.4 (1.7)	2.9 (1.6)	4.3 (1.5)	-1.4
differenza	difference	12 (10)	3.6 (1.9)	4.5 (1.8)	3.6 (1.6)	0.9
femmina	female	12 (10)	3.5 (2.0)	2.5 (1.6)	4.8 (1.9)	-2.3
libertà	freedom	11 (9)	5.6 (1.5)	5.0 (2.0)	3.7 (2.1)	1.3
letteratura	literature	11 (9)	4.3 (1.6)	4.1 (2.0)	4.4 (1.7)	-0.3
sessualità	sexuality	11 (9)	4.4 (1.5)	3.4(1.5)	4.4 (1.3)	-1.0
maschio	male	11 (9)	3.2 (1.8)	2.2 (1.3)	4.7 (1.7)	-2.5
donna	woman	10 (8)	3.8 (1.9)	2.2 (1.4)	5.1 (1.8)	-3.0
tipo	type	9 (7)	2.2 (1.9)	4.9 (1.9)	2.9 (1.9)	2.0
stereotipo	stereotype	9 (7)	4.1 (1.8)	4.6 (1.9)	3.7 (1.9)	0.9
educazione	education	9 (7)	4.0 (1.8)	3.8 (1.6)	3.9 (1.7)	-0.1
musica	music	9 (7)	5.6 (1.3)	3.1 (1.7)	4.7 (1.7)	-1.6
costrutto	construct	8 (6)	2.2 (1.6)	5.2 (2.2)	2.8 (1.7)	2.4
categoria	category	8 (6)	2.1 (1.7)	4.9 (1.9)	3.2 (1.9)	1.8
mascolinità	masculinity	8 (6)	3.7 (1.6)	4.7 (1.6)	3.4 (1.5)	1.3
femminilità	femininity	8 (6)	4.1 (2.2)	4.2 (1.9)	3.9 (1.6)	0.4
femminismo	feminism	8 (6)	4.4 (1.9)	4.2 (1.7)	3.9 (1.7)	0.3
diritti	rights	8 (6)	5.2 (1.3)	4.1 (2.0)	3.9 (1.8)	0.2
queer	queer	8 (6)	3.1 (1.6)	3.9 (1.9)	3.5 (1.5)	0.5
discriminazione	discrimination	8 (6)	5.5 (1.6)	3.8 (1.9)	4.3 (1.5)	-0.5
grammatica	grammar	8 (6)	1.9 (1.3)	3.7 (2.2)	3.9 (2.0)	-0.2
uomo	man	8 (6)	3.3 (1.9)	2.2 (1.2)	4.8 (2.0)	-2.6
identificazione	identification	6 (5)	4.2 (1.6)	4.6 (2.0)	2.9 (1.7)	1.7
espressione	expression	6 (5)	4.1 (2.4)	3.9 (1.9)	3.8 (1.6)	0.1
comportamento	behavior	6 (5)	2.9 (2.1)	3.7 (1.8)	4.3 (1.9)	-0.6

animale	animal	6 (5)	3.5 (1.9)	2.1 (1.4)	5.5 (1.8)	-3.4
appartenenza	belonging	5 (4)	4.1 (1.9)	4.7 (1.9)	3.6 (1.8)	1.2
binarismo	binarism	5 (4)	2.6 (1.9)	4.6 (1.8)	3.2 (2.0)	1.4
politica	politics	5 (4)	3.2 (2.0)	4.5 (2.0)	3.5 (2.0)	1.0
potere	power	5 (4)	3.7 (2.1)	4.4 (1.7)	3.8 (1.6)	0.7
lgbtq	lgbtq	5 (4)	3.6 (2.1)	4.2 (2.2)	3.7 (1.9)	0.5
umano	human	5 (4)	3.8 (2.1)	3.3 (2.0)	4.5 (1.7)	-1.2
corpo	body	5 (4)	4.3 (1.8)	1.6 (1.1)	5.8 (1.7)	-4.2

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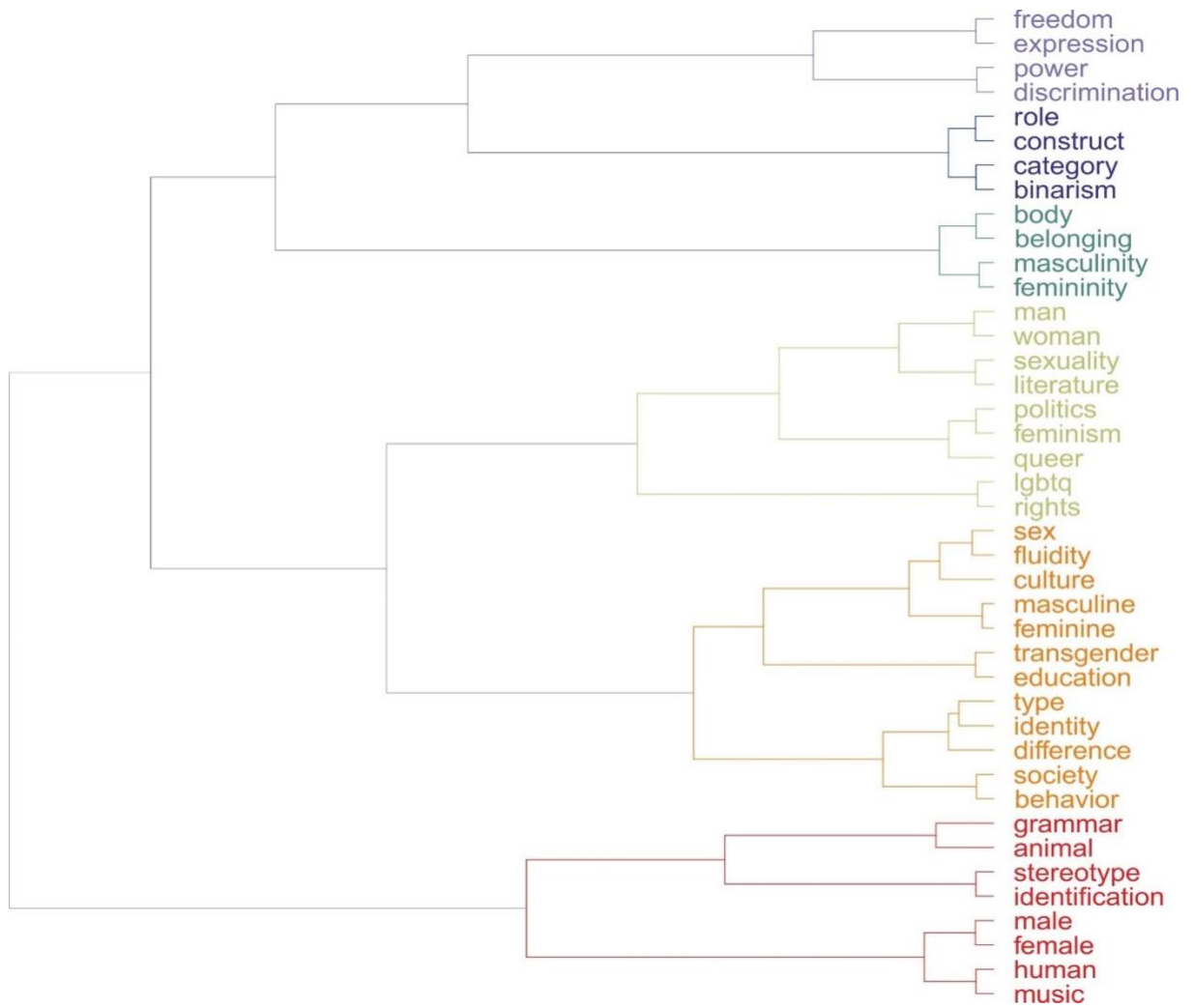
1002

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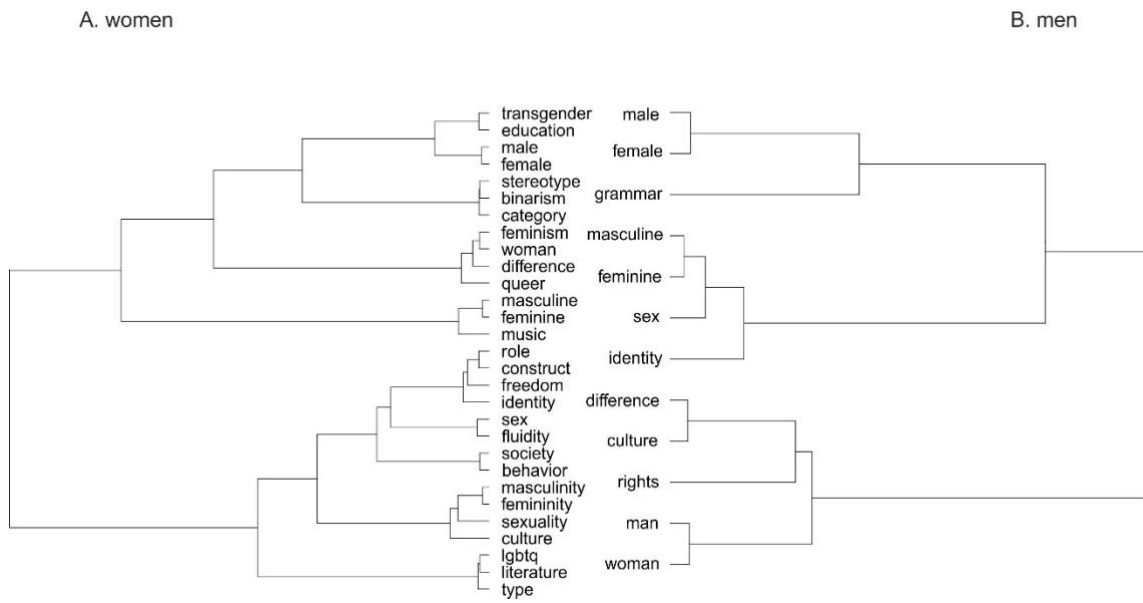
1004   *Figure 1.* Dendrogram representing the six-clusters solution for words produced by at least 5% of participants.

1005

1006

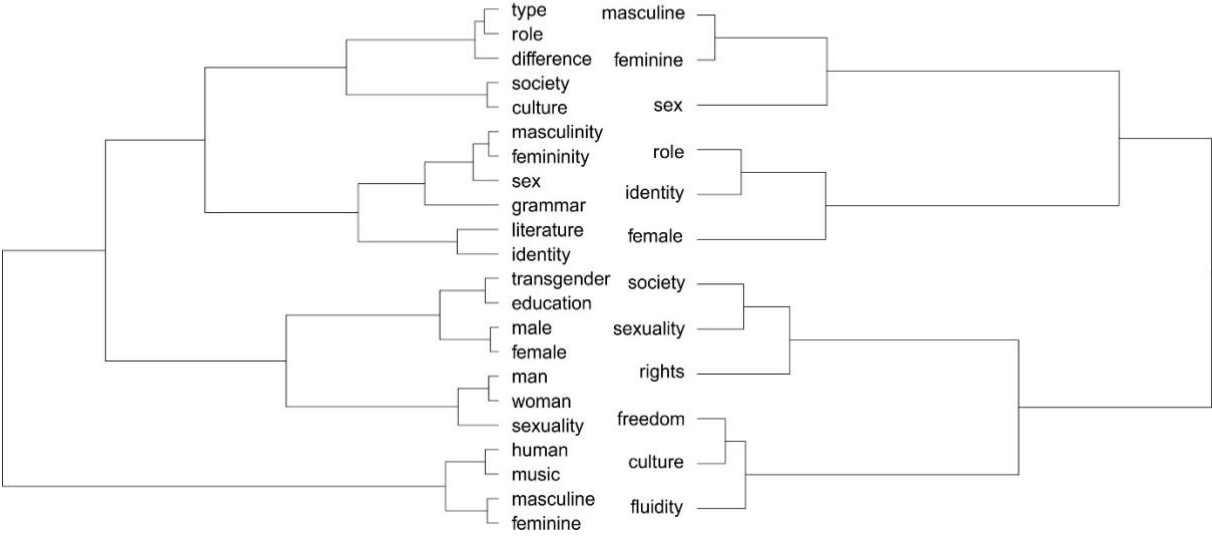A. women   B. men

1007

Figure 2. Dendrograms of words produced by at least 10% of (A) women and (B) men.

1009

C. heterosexuals   D. homosexuals

1010

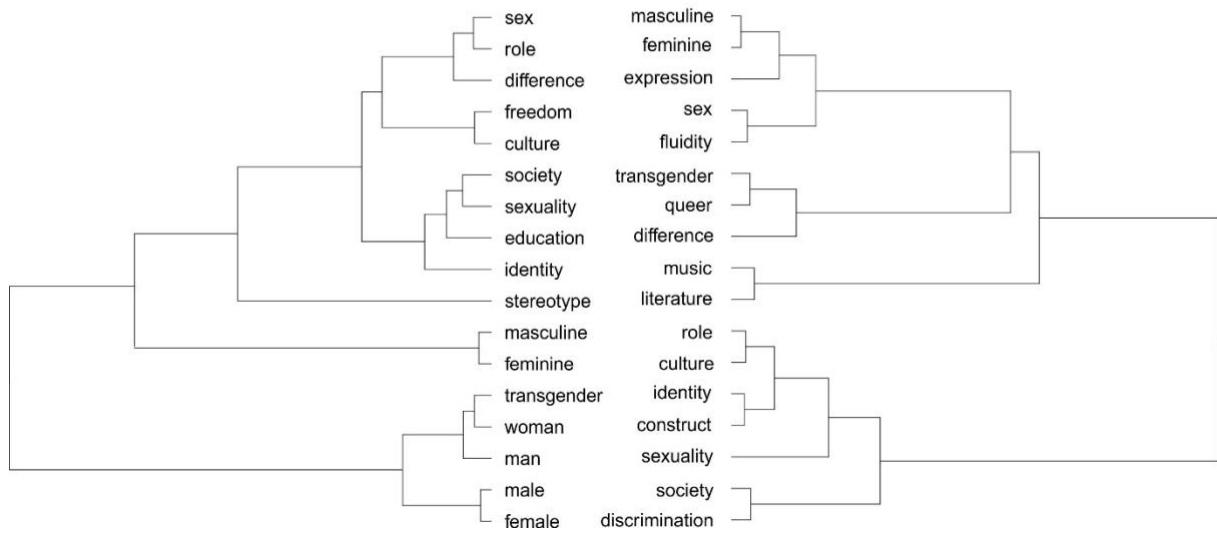1011   *Figure 3*. Dendrograms of words produced by at least 10% of (C) heterosexuals and (D) homosexuals.

1012

E. "normative"   F. "non-normative"

Figure 4. Dendrograms of words produced by at least 10% of (E) "normative" and (F) "non-normative" participants.

[1]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 in order to account for social phenomena such as gender gaps in salary, gender-based violence, and to bring attention to specific gender non-conforming experiences. This growing awareness is due mostly to the efforts of academic and political discourses (LGBTQI+ 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.