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Gender Inequalities in Neolithic Iberia: A Multi-Proxy Approach

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Gender archaeology approaches to Iberian late prehistory have experienced a significant growth in the last two decades. However, much of the work undertaken has focused on specific aspects of the archaeological record (rock art, burial practices), particularly from the Bronze Age and Iron Age periods for which the evidence is more readily available. In addition, it has tended to be regional or local in scope. Here, we attempt an empirically robust multi-proxy approach to the development of early gender inequalities in Neolithic Iberia. Inspired by Gerda Lerner's ideas on the origins of patriarchy and based on a systematic collection of data analysed by means of significance testing, we present the first comprehensive study of gender dissymmetries in Iberian prehistory. Our conclusions suggest that, first, the multi-proxy method used has potential for the systematic study of gender inequalities on the basis of archaeological data and, second, that the Neolithic witnessed emerging gender inequalities that set the basis for male domination in later periods.

Keywords: Neolithic, Iberia, gender inequality, bioarchaeology, burial practices, rock art, significance testing

INTRODUCTION

The application of gender archaeology in Iberian late prehistory has grown significantly over the last two decades. Most of the available literature deals with three specific subjects: 'maintenance activities', rock art, and funerary practices (see for example Escoriza-Mateu, 2002; Montón-Subías & Sánchez-Romero, 2008; Prados Torreira et al., 2012); moreover, most of these studies have a regional, local, or single site focus. In addition, a significant number of articles deal with the Bronze Age, a period for which more accurate demographic and funerary records are available. As far as the Neolithic is concerned, although very recent studies (for example Duboscq, 2017) have made significant contributions, there is a dearth of substantive discussion on aspects such as the social status of women and gender inequalities. In general, no attempt has yet been made to overcome the limitations of regional or local approaches in order to generate broader sociological interpretations.

In this article, which derives from a doctoral thesis submitted to the University of Seville (Cintas-Peña, 2018), we propose an approach to the study of gender inequalities by means of a multi-proxy methodology. Although centred on the Iberian Neolithic, the methodology applied can, in essence, be extrapolated to any prehistoric or historical context. This approach, which aims to use the available evidence systematically, is innovative in that it places the emphasis on the issue of inequality (economic, social, and political) between men and women. Thus, our study

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connects with Second-Wave Feminism which brought about a 'renewed' (not 'new') interest (see Cohen, 2011 for an account) in explaining the causes and origins of male domination under the premise that gender is a socially constructed concept (De Beauvoir, 2011).

The study of this subject has had widespread repercussions in the field of anthropology (e.g. Harris & Young, 1979; Leacock, 1983; Rubin, 1986). Anthropology, however, studies living societies; therefore, while its attempts to demonstrate the cross-cultural variability of gender relations were fruitful, the same could not be said for its endeavours to explain its early roots, which lie in prehistory. Gender studies published in archaeology in the 1980s and 1990s (Dahlberg, 1981; Arnold et al., 1988; Ehrenberg, 1989; Gero & Conkey, 1991; Grauer & Stuart-Macadam, 1998), and later consolidated in the first two decades of the twenty-first century (see Alberti & Back Danielsson, 2014; Dommasnes, 2014; Montón-Subías, 2014 for a review of the main publications), have rarely focused on the causes and forms of early gender dissymmetries. Although not strictly archaeological in its focus, Almudena Hernando Gonzalo's work (2005, 2012) has dealt with this issue from a more theoretical standpoint. Also, it is worth mentioning Marija Gimbutas' classic research into Neolithic and Bronze Age Europe (1974, 1993), where she proposed the transformation of 'agricultural, matricentric, and matrilineal' Neolithic societies (Gimbutas, 1993: 211) into the pastoralist, patrilineal, and patriarchal ones of the Bronze Age. However, the main contribution to this line of enquiry is Gerda Lerner's *The Creation of Patriarchy* (1990), an ambitious study that dated the origin of 'patriarchy' to the 'archaic state' of the second millennium BC, following 2500 years of earlier development (Lerner, 1990: 310). According to Lerner's interpretation, the development of agriculture provided opportunities for men to control women's sexuality as well as for the exchange of women, who became another economic resource. The rise and consolidation of private property and the state would later lead to the consolidation of patriarchy. To date, no attempt has been made to examine Lerner's hypothesis against the available archaeological evidence. We believe that this is largely due to an emphasis on gendered patterns of behaviour in specific case studies rather than a more holistic analysis of early gender roles and inequalities within the Neolithic period as a whole.

Taking the above into consideration, we propose a specific multi-proxy methodology for analysing early gender inequalities within the context of Iberian Neolithic societies. By doing so, we take up the challenge posed by Gerda Lerner thirty years ago, and examine the question surrounding the origin of male domination in the Neolithic through a strictly archaeological approach.

Methodology and Empirical Record

Methodology

The multi-proxy approach we propose for the analysis of early gender inequality is structured around two groups of empirical indicators: demography and living conditions on the one hand and funerary practices on the other.

The first of these two groups of indicators collects six variables associated with the life of the individuals studied and are, therefore, 'bioarchaeological' (*sensu* Larsen, 2015): (i) sex ratios; (ii) diet; (iii) genetic characterization; (iv) mobility; (v) pathologies; and (vi) stress markers. These variables are linked to the individuals' biology and biography; hence, the availability of bioarchaeological or anthropological

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reports was fundamental when selecting the sample included in this study. The second group of empirical indicators informs us about the social management of death, and—through applying an 'isomorphic' principle (*sensu* Binford, 1972: 235)—the social structure itself. It includes seven variables: (i) type of funerary container or burial architecture; (ii) primary or secondary character of the deposit; (iii) individual *vs* collective burial ('individuality marker'); (iv) spatial organization of the burials; (v) position and orientation of the body; (vi) grave goods; and (vii) burial 'gestures' (signs of bone defleshing or manipulation, pigmentations, and heat-induced alterations).

The variables of the first group of indicators directly reveal the living conditions of the individuals under study, while those of the second group only approximately reveal the social conditions of their existence since we do not know to what extent burial practices, as a highly ideological social production, are representative of social relationships. Therefore, the veracity of funerary practices as an indicator of early gender inequality needs to be corroborated by the variables from the first group of empirical indicators, which are intrinsic and inherent to the people under study.

The selection of our sample has been made according to three basic criteria: first, the chronology of the selected contexts must be clear; second, bioarchaeological data obtained under explicitly defined criteria must be available; third, data must be accessible for consultation. After collecting the data and storing them in a purpose-specific database, a qualitative and quantitative analysis of the described variables was carried out, examining the results by means of statistical significance tests (χ^2) in order to verify or reject the null hypothesis—which in this case is, quite literally, that of *no difference* between the genders.

Empirical record

Although our knowledge of the Iberian Neolithic has advanced considerably in recent years, there is a high degree of variability in the quality and level of detail of the studies published. This has a direct bearing on our sampling: in total, twenty-one sites were selected (references to these sites can be found in the online Supplementary Material). Of these sites, six (Los Cascajos, Cueva de Chaves, La Lámpara, Paternanbidea, Cerro Virtud, and Castelo Belinho) are Early Neolithic (sixth and fifth millennia BC). This group of sites includes individual burials with few grave goods, either in caves or negative features, both isolated and grouped. The remaining fifteen sites (Bòbila Madurell, Azután, Camí de Can Grau, Costamar, Alberite, La Caserna de Sant Pau del Camp, Can Gambús, Algar do Bom Santo, Alto del Reinoso, La Sima, Minas de Gavá, Algar do Barrao, La Tarayuela, Cova de les Agulles, and Polideportivo de Martos) date to the Late Neolithic (fourth millennium BC). Within this group of sites, isolated burials are absent; collective burials prevail instead, either as cemeteries with discrete structures, or as caves or megaliths where the bones were mixed and the identity of the individual appears to have been subsumed into a concept of collectiveness. This may have happened either because bones were interred as secondary depositions, or because successive single primary inhumations became commingled after long periods of decay and repeated deposition, thus rendering individuals 'anonymous'.

The geographical distribution of the selected sites shows a significant concentration in coastal regions, whereas central Iberia has fewer sites (Figure 1). The largest number of funerary sites, grouped in the so-called 'pit burials' culture, appear in the north-east. This geographical

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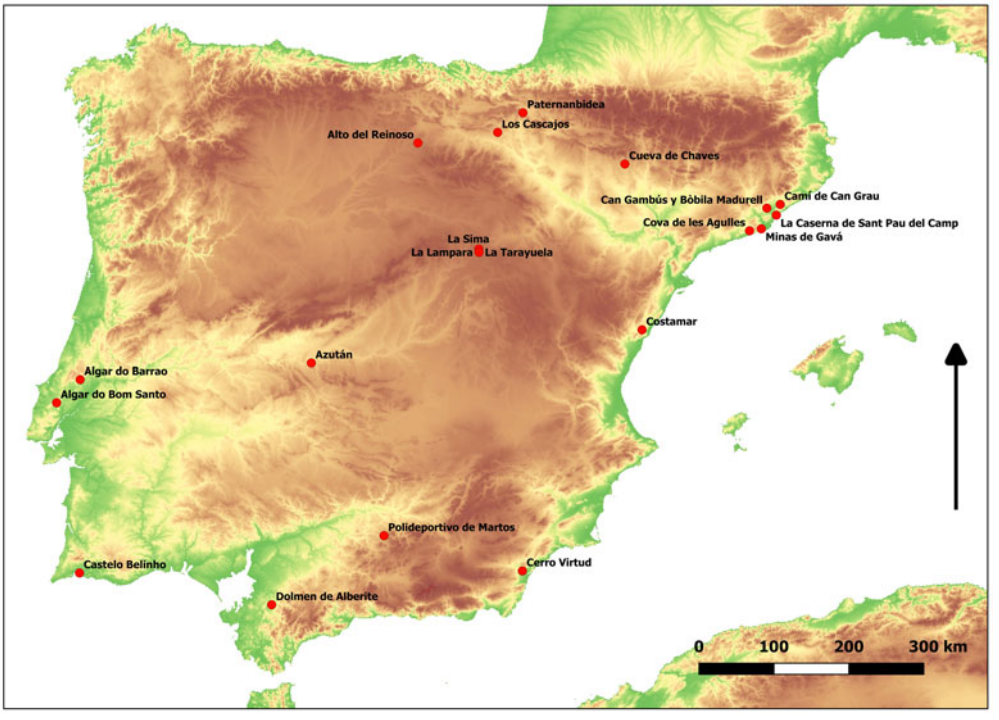

Figure 1. *Location of sites with funerary contexts included in this study (drawn by Manuel Eleazar Costa Caramé).*

distribution also reveals the existence of some degree of regional variability: pit burials in the north-east, 'lime-kiln' tombs in the northern half of the Spanish central plateau, and collective burials in caves along the Lower Tagus river. These twenty-one sites comprise 515 individuals in total (Table 1). For reference, the estimated data for the Iberian Upper Palaeolithic and Mesolithic lead to a selection of fifty-one individuals for the former (according to Pérez Iglesias, 2012–2013: 243) and 450 individuals for the latter (according to Arias Cabal, 2014: 71).

Analysis

Demography

Published sexual identifications are only available for 198 individuals of the total sample of 515 compiled by us; but, in all cases studies, these were carried out after the 1980s and used modern scientific standards. Of those, 119 are males or likely to be male (23.11 per cent), and seventy-nine are female or probably female (15.34 per cent). This leaves 317 individuals undetermined. Therefore, among those individuals whose sex was identified or estimated, males greatly outnumber females by 151 per cent. Although the high number of individuals of undetermined sex demands caution when evaluating these data, this result is, by definition, inconsistent with what would be expected from the demographic structure of a normal population. Some specific sites, such as Los Cascajos, Costamar, and La Tarayuela, and, to a lesser extent, Cerro Virtud and Algar do Bom Santo (the minimum number of individuals (MNI) of fifteen at the latter site is not the site total,

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Table 1. *Individuals by sex.*

	Site	F / F?		M / M?		UND		NAD		TOTAL
		N	%	N	%	N	%	N	%	
6th-5th mil. BC.	Los Cascajos	4	11.11	23	63.89	6	16.67	3	8.33	36
	Cueva de Chaves	0	0.00	1	100.00	0	0.00	0	0.00	1
	La Lámpara	1	100.00	0	0.00	0	0.00	0	0.00	1
	Paternanbidea	5	38.46	5	38.46	1	7.69	2	15.38	13
	Cerro Virtud	2	18.18	5	45.45	4	36.36	0	0.00	11
	Castelo Belinho	0	0.00	3	18.75	10	62.50	3	18.75	16
4th mil. BC.	Bòbila Madurell	13	9.29	12	8.57	61	43.57	54	38.57	140
	Azután	0	0.00	1	11.11	3	33.33	5	55.56	9
	Camí de Can Grau	11	28.95	12	31.58	5	13.16	10	26.32	38
	Costamar	0	0.00	4	57.14	0	0.00	3	42.86	7
	Alberite	1	50.00	1	50.00	0	0.00	0	0.00	2
	Caserna Sant Pau del Camp	4	15.38	3	11.54	3	11.54	16	61.54	26
	Can Gambús	8	14.04	7	12.28	42	73.68	0	0.00	57
	Algar do Bom Santo	3	20.00	8	53.33	3	20.00	1	6.67	15
	Alto del Reinoso	6	14.29	13	30.95	8	19.05	15	35.71	42
	La Sima	9	34.62	2	7.69	5	19.23	10	38.46	26
	Minas de Gavá	7	30.43	5	21.74	6	26.09	5	21.74	23
	Algar do Barrao	2	10.00	3	15.00	11	55.00	4	20.00	20
	La Tarayuela	1	5.88	11	64.71	2	11.76	3	17.65	17
	Cova de les Agulles	0	0.00	0	0.00	4	40.00	6	60.00	10
	Polideportivo de Martos	2	40.00	0	0.00	0	0.00	3	60.00	5
		79		119		174		143		515

F/F?: female or probably female; M/M?: male or probably male; UND: adult of undetermined sex; NAD: non-adult of undetermined sex. In grey, group prevailing at the site.

Table 2. Individuals by age.

Site	Adults		Non-adults		Undetermined		TOTAL
	n	%	n	%	n	%	
Los Cascajos	25	69.44	6	16.67	5	13.89	36
Cueva de Chaves	1	100.00	0	0.00	0	0.00	1
La Lámpara	1	100.00	0	0.00	0	0.00	1
Paternanbidea	9	69.23	4	30.77	0	0.00	13
Cerro Virtud	10	90.91	1	9.09	0	0.00	11
Castelo Belinho	9	56.25	3	18.75	4	25.00	16
Bòbila Madurell	82	58.57	54	38.57	4	2.86	140
Azután	4	44.44	5	55.56	0	0.00	9
Camí de Can Grau	25	65.79	11	28.95	2	5.26	38
Costamar	4	57.14	3	42.86	0	0.00	7
Alberite	0	0.00	0	0.00	2	100.00	2
Caserna Sant Pau del Camp	9	34.62	16	61.54	1	3.85	26
Can Gambús	55	96.49	0	0.00	2	3.51	57
Algar do Bom Santo	14	93.33	1	6.67	0	0.00	15
Alto del Reinoso	25	59.52	17	40.48	0	0.00	42
La Sima	15	57.69	10	38.46	1	3.85	26
Minas de Gavá	17	73.91	5	21.74	1	4.35	23
Algar do Barrao	16	80.00	4	20.00	0	0.00	20
La Tarayuela	14	82.35	3	17.65	0	0.00	17
Cova de les Agulles	4	40.00	6	60.00	0	0.00	10
Polideportivo de Martos	2	40.00	3	60.00	0	0.00	5

Blue: 0% non-adults; yellow: ≤20% non-adults; green: +20% non-adults.

but the total from one area where it has been possible to individualize the remains to a degree), show a remarkable predominance of males, even if all the individuals of undetermined sex turned out to be female. Conversely, no site shows a majority of females on the same terms, except, perhaps, La Sima where a high number of undetermined individuals is found.

As for age, there are 340 adults (66 per cent), 153 non-adults (29.7 per cent), and twenty-two individuals of undetermined age (4.3 per cent) represented in our sample (for a discussion of this terminology, see Cintas-Peña et al., 2018). Bearing in mind that the overall estimations for demographically archaic (i.e. premodern) populations place child mortality between thirty and seventy per cent (Bocquet & Masset, 1977) or between forty and fifty per cent (Rinne, 2001) but never below twenty per cent (Lohrke et al., 2002), the percentage non-adults in our sample is likely to represent a natural population in terms of age. The situation for each archaeological site (Table 2), however, varies greatly. No children were counted among the fifty-seven individuals identified at Can Gambús; whereas, at six other sites, the percentage of non-adults is twenty per cent or less. The remaining eleven sites show percentages of non-adult individuals greater than twenty per cent.

The sex and age analysis suggests that, in Neolithic Iberia, there was a high degree of variability in how funerary deposits reflected

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the natural structure of the population, an aspect that is in line with recent observations made for the Copper Age (Cintas-Peña et al., 2018). At sites such as Los Cascajos, Cerro Virtud, and La Tarayuela, the buried population does not reflect a natural demographic structure. The fact that neither females nor non-adult individuals appear in the expected demographic ratios suggests that neither had the same probability of a formal burial as males. Thus, although in principle it would appear that at least in some communities there was a cultural bias against inhuming females, which, conversely, do not have any correlates where males are concerned, the significance testing results discussed below do not support the existence of statistically significant differences between males and females in terms of burial types. Although the Iberian Neolithic human bone record may be to some degree potentially representative of the population structure, caution is necessary when making sociological interpretations based on these data as demographic and funerary information appear to be to some extent contradictory.

In terms of pathologies, data are available for 108 individuals (21 per cent of all 515 individuals) including thirty-one females and forty-one males. The most frequent pathologies in this data set are dental (n = 86 individuals), followed by joint diseases (n = 53), metabolic (n = 16), and trauma (n = 12), while the remaining thirteen subjects were affected by conditions grouped as 'miscellaneous'. There are no statistically significant differences in how these pathologies affected male and female individuals in the Neolithic, except for trauma, which appears in just one of the thirty-one females, but in ten of the forty-one males (Supplementary Material, Table 1). The χ^2 test for trauma gives a result of 6.109, greater than the critical value of χ^2 for 1 degree of freedom at 0.05 (3.8415), suggesting a statistically significant difference between the sexes. Recorded traumas include fractures to the skull, ribs, or arms (Martí et al., 1997: 68, 72, 94; Alt et al., 2016), as well as deviation of nasal bones as a consequence of impact (Villalba, 1999: 49). They may have resulted from violence, although their characteristics also make them compatible with accidents and the available publications provide no grounds for regarding one possibility as more likely than the other. However, there are six cases of clear interpersonal violence, affecting four males, one female, and one individual of undetermined sex: an adult of undetermined sex from Bòbila Madurell (Allièse, 2016: 168), a male adult from Camí de Can Grau (Martí i Rosell et al., 1997: 79), two male adults and one female adult from Minas de Gavá (Villalba Ibáñez, 1999: 49; Casas & Majó, 2009: 218–19; Borrell Tena et al., 2015: 83), and a probable male adult from Costamar (Polo Cerdá & García Prósper, 2009: 405). Despite there being more males than females affected by instances of violence, the small number of observations prevents statistically significant results from being obtained.

As with pathologies, the analysis of occupational stress markers is curtailed by the lack of sufficient individualized data. The existence of differences between men and women in relation to bone markers is referred to in some publications (Estebaranz et al., 2008); but, within our sample, individualized observations are available for only thirteen individuals (Supplementary Material, Table 2), including six females, six males, and one individual of undetermined sex—which does not provide good grounds for discussing differences between sexes.

With respect to diet, a total of 147 results have been obtained from carbon and nitrogen stable isotope analysis (Figure 2 and Supplementary Material, Table 3), which correspond to 142 of the 515 individuals available. This dataset

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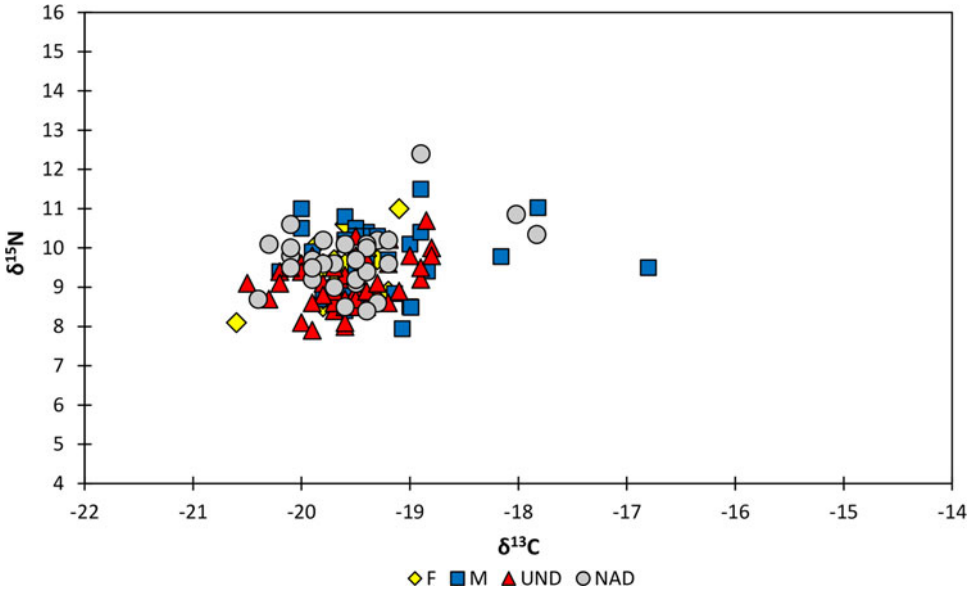

Figure 2. *Values of $\delta^{13}C$ and $\delta^{15}N$ for Iberian Neolithic people. F: female or probably female; M: male or probably male; UND: adult of undetermined sex; NAD: non-adult of undetermined sex.*

reveals a diet predominantly based on terrestrial resources with a low intake of marine resources by Iberian Neolithic populations. The averages for males and females from the different sites do not differ by more than one per cent; and those individuals not in keeping with the group include both females and males, individuals of undetermined sex, and non-adults. Fontanals-Coll et al. (2015) detect greater values of $\delta^{13}C$ and $\delta^{15}N$ in some males from Can Gambús, but the review of the anthropological data on sex by Allièse (2016) suggests that these results must be treated with caution.

Regarding mobility, strontium and oxygen stable isotope data were obtained for the sites of Algar do Bom Santo and Alto del Reinoso (Supplementary Material, Table 4). In both cases, there are no differences between males and females that may prompt speculation about residence patterns. The same goes for aDNA. In this case, analyses with individualized information are available for the sites of Los Cascajos, Paternanbidea, Algar do Bom Santo, and Alto del Reinoso, although there are other publications which include data from La Tarayuela, Cueva de Chaves, La Caserna de Sant Pau del Camp, and Camí de Can Grau (Supplementary Material, Table 5). The results do not warrant discussion on the distinction between males and females, and the variability or homogeneity of haplogroups affects both sexes equally.

Funerary practices

Megalithic monuments became widespread at the end of the fifth millennium and beginning of the fourth millennium BC, leading to a diversification of burial architecture (Figure 3 and Supplementary Material, Table 6). Females, males, individuals of undetermined sex, and non-adults were buried in different types of burials in a non-statistically different way, with none of the χ^2 tests giving results allowing

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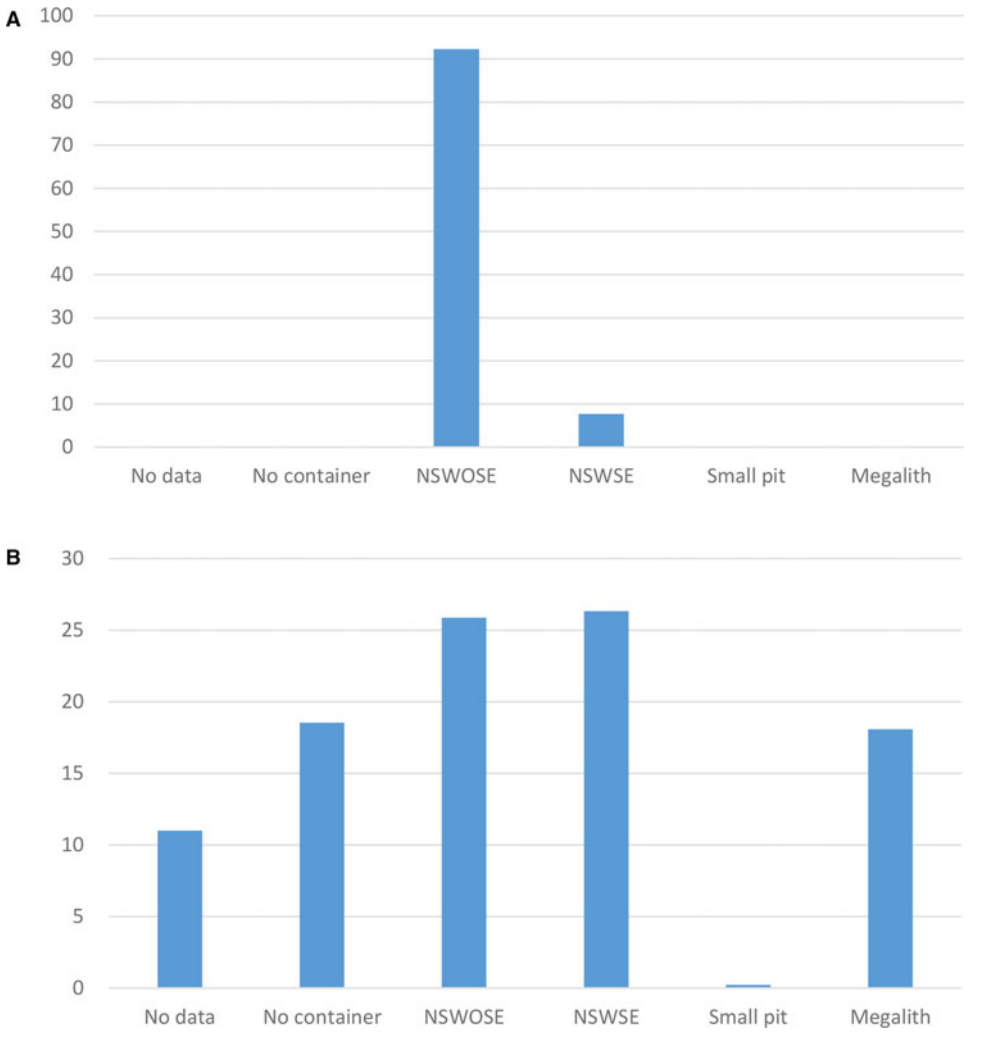

Figure 3. *Classification of individuals by burial architecture. A: burial structures of the sixth–fifth millennia* BC*; B: burial structures of the fourth millennium* BC*. NSWSE: negative structure with stone elements; NSWOSE: negative structure without stone elements.*

for a rejection of the null hypothesis (Supplementary Material, Table 7).

The spread of megalithic architecture is also relevant when addressing the primary or secondary character of the human remains and the distinction between individual and collective contexts. During the Early Neolithic (sixth and fifth millennia BC), the remains in primary position amounted to fifty-six per cent of the total whereas secondary deposits comprised twelve per cent. In the Late Neolithic (fourth millennium BC), however, primary deposition fell to forty-five per cent while those of secondary nature increased by 15 points, reaching twenty-seven per cent (Supplementary Material, Figures 1 and 2). This change is widely noted regardless of the sex of the buried individual.

Concerning the degree of individualization of the burial architecture, an increase in collective burials in the Late Neolithic

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is evident. In the Early Neolithic, people buried individually make up 58.97 per cent of the total; while, in the Late Neolithic, this figure drops to 42.79 per cent. Although individual burials did not disappear in the fourth millennium BC, there was a significant reduction in favour of collective burials, which gradually became more widespread. The trend towards collective burials continues until the end of the third millennium BC. There are no statistically significant differences between the numbers of males and females in individual and collective tombs.

The same can be said about the spatial organization of tombs and sex (the analysis of this variable only took into account sites with more than five burial structures). In some instances, however, there is a relationship with age. At Castelo Belinho and Bòbila Madurell, distinct burial areas for adults and non-adults were found. At Castelo Belinho, the three graves containing non-adults were found in the southern area, whereas the corresponding adult burials were slightly further north (Gomes, 2012: 121). At Bòbila Madurell, meanwhile, infant tombs make up thirty per cent of the total burials in the central area, although they represent seventy per cent of the individuals inhumed in the sector further south (Alliès, 2016: 151–52).

Overall, the most frequent body posture is the supine position (134 out of 515 individuals) with flexed lower and upper limbs, for adults and non-adults, males, females, and individuals of undetermined sex. Body posture does not differ according to sex or age either at a general Iberian level or within sites. This also applies to the orientation of the body. The most common orientation for the recorded subsample (with a total of eighty-two individuals) is with the head to the north-east and the feet to the south-west. Insofar as this pattern indicates that the head was pointing towards sunrise, it matches what is known for the easterly orientation of most Iberian megalithic monuments (Hoskin, 2001).

Our analysis of the contents of the tombs includes three different variables: (i) artefact type; (ii) artefact function; and (iii) individuals who stand out for the quantity and quality of the items associated with them. Of course, not all recorded burials yielded artefacts; in addition, in those where objects were discovered, it was not always possible to establish a clear connection between an artefact and a person. In our sample of 515 individuals, 372 (72.23 per cent) were buried with material culture, whereas 143 (27.77 per cent) were not. Of those 372, we must disregard 158 individuals found in collective tombs where bones and artefacts were very mixed, meaning no clear association between objects and persons could be established. Thus, the number of individuals who were clearly associated with artefacts is 214, including, forty females, fifty-two males, seventy-three individuals of undetermined sex, and fifty non-adults. In all age and sex groups, there is a predominance of 'technomic' artefacts, as opposed to those considered 'sociotechnical' or 'ideotechnical', or, to put it slightly differently, a predominance of artefacts with a practical purpose, as opposed to artefacts thought to have a social or ideological significance; however, this only reveals a social or cultural preference applicable to all Iberian Neolithic societies and the (relatively low) degree of social complexity in this period.

The results of the χ^2 tests do not reveal differences in the distribution of these grave goods by sex in any of the artefact categories. Only in one case must the null hypothesis be rejected, and only for Late Neolithic contexts, where women are associated with ceramic vessels with a significantly higher frequency than men (Table 3). On the other hand, at the site of Bòbila Madurell, male individuals were

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Table 3. *Distribution of grave goods in burials with positive results in χ2 tests.*

***c.* fourth millennium BC, Iberian Peninsula**					
Ceramic	Absence	Presence	TOTAL	χ^2	Null hypothesis
F/F?	7	24	31	6.8611	Rejection: there are differences
M/M?	18	15	33		
	25	39	64		
Bone/horn	Absence	Presence	TOTAL	χ^2	Null hypothesis
AD	68	61	129	6.2985	Rejection: there are differences
NAD	36	13	49		
	104	74	178		
Fauna	Absence	Presence	TOTAL	χ^2	Null hypothesis
AD	77	52	129	7.5191	Rejection: there are differences
NAD	18	31	49		
	95	83	178		
***c.* fourth millennium BC, Bòbila Madurell**					
Projectiles	Absence	Presence	TOTAL	χ^2	Null hypothesis
F/F?	9	0	9	4.56	Rejection: there are differences
M/M?	6	4	10		
	15	4	19		

F/F?: female; M/M?: male; AD: adults; NAD: non-adults.

more frequently associated with arrowheads than females (Table 3). Although not directly relevant to the study of gender inequalities, it is worth adding that, overall, there is also a significantly higher association of objects made from bone or horn and faunal remains with non-adult individuals.

In order to address the sociological implications of the quality and quantity of grave good associations, we have selected individuals who stand out in comparison to others (Table 4). The small resulting sample (just eleven of the 515 individuals considered in this study) does not show any gender differentiation, since it comprises three women, three men, four adults of undetermined sex, and one non-adult (the latter only represented at Bòbila Madurell).

Finally, among the 'funerary gestures' of the 515 individuals, five cases of trepanation (Supplementary Material, Table 8) and seventeen cases of defleshing were documented, but their frequency does not differ by sex in a statistically significant way. Only adults show signs of trepanation (three males, one female, and one individual of undetermined sex), while traces of manipulation (at Algar do Bom Santo and Alberite) are not individualized with enough clarity to associate bone fragments with specific individuals. The presence of pigments (either ochre or cinnabar) (Supplementary Material, Table 9) confirmed for two females, three males, and nine individuals of undetermined sex does not indicate a preferential association by sex either. It does, however, seem to be associated with age, as there is no mention of the ritual use of ochre or cinnabar on the bodies of non-adults. Evidence of fire was found in the funerary contexts of Bòbila Madurell, Cueva de

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Table 4. Selection of individuals with outstanding sets of grave goods.

Id Pub	Sex	Age	Site	Raw material	Description	Reference
CAS-196	M	AMA (36-45)	Los Cascajos	Fauna	2 ovicaprine metapodials and 4 deer antlers next to the right shoulder	García Gazólaz & Sesma Sesma, 2007: 56
				Ceramic	1 complete ceramic bowl on the hands, which were together	García Gazólaz et al., 2011: 139
				Lithic	1 small hand axe (sillimanite) and 1 flint exhausted core used as fire starter, both of them next to the right shoulder	García Gazólaz & Sesma Sesma, 2007: 56
				Bone/horn	1 long palette (bone?) next to the right shoulder	García Gazólaz & Sesma Sesma, 2007: 56
PAT-2E1 | Ind. A	F?	AO (13-17)	Paternanbidea	Lithic and fauna	1 beaded bracelet formed by 222 beads of bone, stone, and shell wrapped 7 times around the arm; 1 beaded necklace formed by 406 beads of bone, stone (variscite?), and shell	García Gazólaz, 1998: 46; García Gazólaz & Sesma Sesma, 2007: 62; Hervella Afonso, 2010: 186 y 187
				Lithic	2 microliths and 1 flint blade	García Gazólaz & Sesma Sesma, 2007: 62; Hervella Afonso, 2010: 186
PAT-4E2 | Ind. B	F	AME (26-35)	Paternanbidea	Lithic	1 microlith and 1 rock monocrystal, the latter under the pelvis	García Gazólaz & Sesma Sesma, 2007: 63; Hervella Afonso, 2010: 189
CV-8	UND	AD	Cerro Virtud	Ceramic	2 ceramic vessels placed face down, one of them containing a third one	Montero Ruiz & Ruiz Taboada, 1996: 68
Est. 4	UND	AD	Castelo Belinho	Fauna	22 *Glycymeris bimaculata* bracelets, 11 in each arm, and some faunal remains	Gomes, 2010: 71
				Ceramic	Some ceramic fragments from a spherical bowl and a cup	
				Lithic	2 hammerstones, 1 flint blade, 2 grinding stones, and 3 flakes	
MS-61	NAD	NAD	Bòbila Madurell	Fauna	5 coral beads on thorax, 17 ovicaprine remains in the upper part of the body, 7 undetermined faunal remains, and 1 lagomorph remain in the upper part of the body	Allièse, 2016: 203, Duboscq, 2017: BD: mobilier funéraire par individu
				Ceramic	6 fragments	Duboscq, 2017: BD: mobilier funéraire par individu
				Lithic	1 flint fragment and 2 flint cores in the upper part of the body; 108 variscite beads on neck and thorax	Allièse, 2016: 181, 196; Duboscq, 2017: BD: mobilier funéraire par individu
				Bone/horn	2 palettes in the upper part of the body; 3 punches (2 in cranial area y 1 in the upper part of the body; 1 perforated plaquette next to the right shoulder)	Allièse, 2016: 181; Duboscq, 2017: BD: mobilier funéraire par individu

CCG-30	F	AD	Camí de Can Grau	Fauna	1 perforated (vertex) *Glycymeris* with ochre remains inside placed on the upper part of the thorax	Martí i Rossell et al., 1997: 59
				Ceramic	1 vessel in the right side, near the skull	
				Lithic	3 honey flint blades (1 of them retouched on the crania and parallel to the humerus); 2 honey flint trapezes on the right side of the body, in the cranial area	
				Bone/horn	1 perforated plaquette on the right side of the body, cranial area 2 points at the left side (1 in the cranial area and 1 parallel to the humerus); 11 punches on the right-hand side of the body near the skull	
GE 310-563 | 7611	M?	AME (26-35)	Costamar	Fauna	'Fauna' (Flors Ureña, 2010: 181) and/or 'Macrofauna associated to the ritual' and/or 'fauna' (Polo Cerdá & García Prósper, 2009: 404)	Polo Cerdá & García Prósper, 2009: 404; Flors Ureña, 2010: 181
					Some bracelets made from shell and with ochre remains	Flors Ureña, 2010: 181
					307 beads (287 complete and 20 incomplete); more than 800 shell beads around the neck	Polo Cerdá & García Prósper, 2009: 404; Flors Ureña, 2010: 181
				Ceramic	'Abundant decorated ceramic fragments' (Flors Ureña, 2010: 181) and/or '4 formless fragments' (Polo Cerdá & García Prósper, 2009: 404)	
				Lithic	3 flint fragments	Polo Cerdá & García Prósper, 2009: 404
GE 000-096 | 7610	M?	AD	Costamar	Lithic	2 polished hand axe; 1 necklace with 36 'green stone' beads (possibly variscite); 1 chisel	Flors Ureña, 2010: 182
CG-1 122	UND	AD	Can Gambús	Fauna	6 phalanxes (5 *Ovis aries* and 1 caprine)	Allièse, 2016: 129
				Ceramic	1 type 2 vessel and 1 type 1 vessel on the right-hand side; 5 fragments; all showing ochre	Duboscq, 2017: BD: mobilier funéraire par individu
				Lithic	1 nephrite and 1 schist polished stone near the skull, with presence of ochre; 1 honey flint core in the cranial area, with ochre; 106 variscite beads on the neck, thorax, and pelvis; 4 honey flint blades (1 on thorax, 2 right arm, and 1 upper part of the body), with ochre	Allièse, 2016: 104 y 105; Duboscq, 2017: BD: mobilier funéraire par individu
				Bone/horn	2 punches with ochre on the upper parts 1 spatula with ochre on the right-hand side; 18 punches with ochre on the right-hand side; 2 punches with ochre; 1 perforated plaquette at the bottom of the pit; 2 punches near the skull	Allièse, 2017: 104 y 106; Duboscq, 2017: BD: mobilier funéraire par individu

Table 4. (*Cont.*)

Id Pub	Sex	Age	Site	Raw material	Description	Reference
	UND	AD	Minas de Gavá	Ceramic	1 vessel	Borrell Tena et al., 2005: 637; Borrell Tena et al., 2015: 79
				Lithic and fauna	2 set of necklace beads: 61 of variscite and *c.* 200 of red coral	
				Lithic	1 obsidian blade; 3 honey flint cores; 8 complete or almost complete blades, and 1 honey flint blade fragment; 3 black stone hand axes; 1 white stone hand axe	
				Bone/horn	Fragments from at least 5 punches	

Sex categories: F/F?: female or probably female; M/M?: male or probably male; UND: undetermined; NAD: non-adult of undetermined sex. Age categories: NAD: non-adult; AO: adolescent/juvenile; AD: adult; AME: adult of middle age; AME: adult of mature age.

Chaves, La Tarayuela, La Sima, and Costamar. In the cases that can be individualized, they affected two male adults, one child, and two adults of undetermined sex, which would indicate that there are no differences regarding sex.

Discussion

The evidence presented above lays the foundations for an entirely new perspective on gender inequalities in the Iberian Neolithic. Our discussion will focus on four major areas: the rite of formal burial, living conditions, the appearance of specialized social roles, and the growing association of males with signs of violence.

In the sample used in this study, it appears that many more males (n = 119) than females (n = 79) were accorded a formal burial rite. Although it may be tempting to ask whether the large number of individuals of undetermined sex might be masking a balance between the sexes, in fact, on sites where there are no individuals of undetermined sex, males also predominate in the burial record. In the main, the imbalance between males and females in Neolithic funerary contexts is incompatible with a natural demographic structure and should, therefore, be explained by social and cultural factors.

Hints of this quantitative prevalence of males over females in the Neolithic Iberian funerary record were previously detected in a study of megalithic monuments of the Spanish Northern Plateau (Rojo Guerra et al., 2005: 62). This research included some sites also selected in the present study, such as La Tarayuela, as well others which were not selected, such as the dolmen at Las Arnillas (Delibes de Castro, 1995), as they did not meet the methodological criteria. Duboscq (2017: 464–65) also notes a statistical bias

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against females on sites located in north-eastern Iberia, within the groups she refers to as 'Vallés-Litoral' and 'megalithic tombs'. Thus, male prevalence in Neolithic tombs is suggested on a specific level (at sites such as Los Cascajos), on a regional level (in megalithic constructions in the interior and north-east of the peninsula, as well as in 'Vallés-Litoral' sites), and on an Iberian-wide level if we consider the total number of sexed individuals in our sample. Therefore, a first finding from our study is that formal burial rites were largely restricted to males.

Interestingly, the eastern Spanish Levantine rock art also reveals a strong quantitative bias against females (Supplementary Material: Table 10). Early publications (for example Díaz-Andreu, 1998) argued against the existence of a clear gender bias in Spanish Levantine rock art, suggesting that unsexed anthropomorphs should not be presumed to be masculine even if they show male markers (such as, for example, a bow). In a recent synthesis by M. Lillo Bernabéu (2014: 277), however, 1073 out of 1315 human figures regarded as 'male' are interpreted as archers. Although not all of these figures have phalluses, some do, and, crucially, no female representation (figures with breasts) is ever associated with a bow. Female figures are never depicted in hunting or fighting scenes, with one single (but dubious) exception (López Montalvo, 2015: 319). The empirical record of Neolithic Iberia does, therefore, unambiguously suggest the greater presence of males over females in two ideologically-charged domains: burial practices and graphic art.

Nevertheless, none of the tests carried out in this study revealed statistically significant differences between males and females in terms of diseases (except for traumas), occupational stress markers, or diet. In the case of Can Gambús, some males have greater $\delta^{15}N$ values than females, perhaps indicating greater meat consumption (Fontanals-Collet et al., 2015: 166), but this data must be treated with caution, considering the anthropological review of the sex estimations undertaken by Allièse (2016). Moreover, this evidence cannot be extrapolated to all Iberian Neolithic societies.

With respect to the possible appearance of specialized social roles, again most of the tests do not suggest statistically significant differences in the association of males and females with different types of material culture or technology. Nevertheless, some highly interesting exceptions can be noted. First, there is a statistically robust tendency whereby, overall, females are more frequently associated with ceramic vessels than male individuals in the Later Neolithic. Second, on various sites in north-eastern Iberia and especially at Bòbila Madurell, there is a statistically significant association between males and arrowheads (Table 3) (Gibaja Bao & Palomo, 2004; Duboscq & Gibaja Bao, 2016; Duboscq, 2017: 491). In the 156 funerary structures from twenty-one sites located in the north-east of the peninsula considered by Duboscq and Gibaja Bao, fifteen per cent of females, sixteen per cent of infants, and sixty-six per cent of males are associated with projectiles (Duboscq & Gibaja Bao, 2016: table 4). The relationship between males and arrows is not exclusive, although it is statistically significant. This relationship is also evident in the northern Pyrenees, on sites such as Balloy, where the association between males and projectiles has been interpreted in terms of ostentation (Chambon & Pétillon, 2009: 781). This, once again, is in keeping with the data on Spanish Levantine rock art, whereby only male figures appear with bows and arrows (Lillo Bernabéu, 2014: 277; López-Montalvo, 2018: 13). This suggests that, during the Iberian Neolithic, there was a delimitation of social roles, with the bow and

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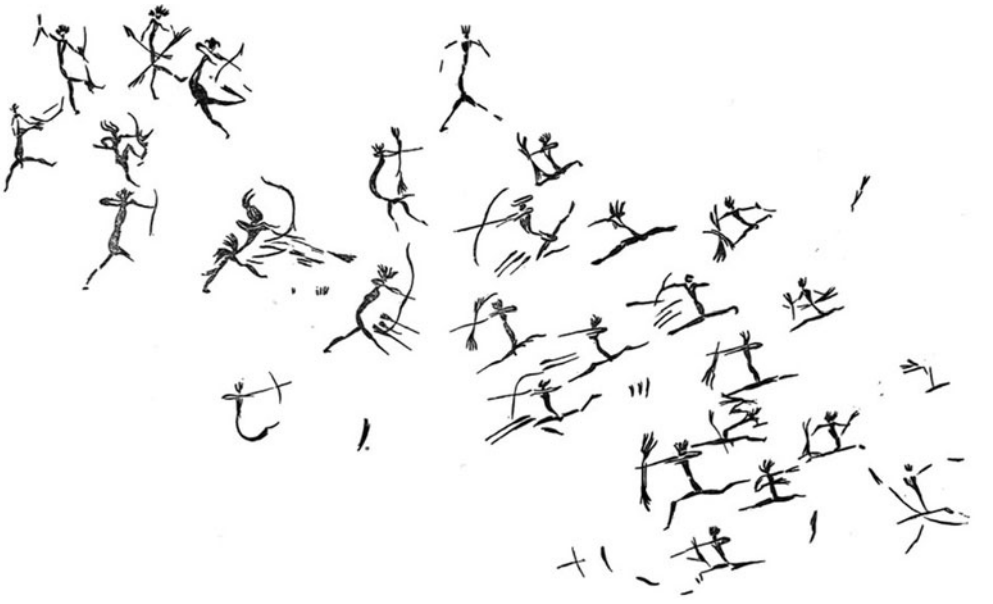

Figure 4. *Spanish Levantine rock art from Les Dogues (Ares del Maestre, Castellón) showing a possible war scene (Porcar, 1953).* Reproduced by permission of Museu de Prehistòria de València.

projectiles operating as markers of masculinity. Hunting and warfare, represented by holding a bow and arrow, appear as a masculine business (Figure 4). The presence of females, in hunting scenes as well as in the (only) fighting scene, is nominal; this is also in keeping with what has been observed in the physical anthropological record, as we will discuss later.

Bòbila Madurell and Can Gambús show other interesting patterns in relation to grinding stones and marine molluscs (Allièse, 2016: 253–54), as well as polished hand axes (Masclans Latorre, 2017: 411). The χ^2 test reveals that grinding stones and marine shells are more frequently associated with males than with females. Only a quarter of the burials containing polished axes in Can Gambús are female, which leads the author of the study to contend that 'only in special cases [were] women eligible of receiving a PBA [polished and bevelled artefact], being generally those women who had more chance of accumulating valuable goods' (Masclans Latorre, 2017: 412). Use-wear analysis of polished hand axes from sites belonging to the pit burials culture suggests that the axes discovered in female tombs were used for tanning, while those deposited in male tombs were used for tasks such as the cutting of meat and/or woodworking (Masclans Latorre et al., 2016: 13; Masclans Latorre, 2017: 412). This would also suggest the existence of a sexual division of labour and emerging gender roles. Of course, an interesting future line of research would be to verify to what extent the presence of specialized gender roles at these sites can be extrapolated to Iberian Neolithic societies in general.

As stated above, the sample studied here does not reveal statistically significant differences in the distribution of males and females by burial type. Furthermore, within the small group that we could hypothetically describe as the social 'elite' of the Neolithic period—three females, three males, four adults of undetermined

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sex, and one non-adult buried in 'special' conditions—there are no significant gender differences. At certain sites, however, some subtle differences come to light. For example, in Can Gambús-1, there is a higher frequency of males in complex funerary structures (Duboscq, 2017: 217); and on sites with a greater female presence, for example to the south of the Llobregat River, it is males who accumulate the more valuable grave goods, despite being in the minority (Duboscq, 2017: 488). There is similar evidence at other sites not selected for this study (e.g. at La Peña de la Abuela female bone remains were found in an area with very few grave goods, outside the so-called the 'noble area': Rojo Guerra et al., 2005: 61).

This evidence, although not statistically significant, suggests that, in certain cases, burials (and especially megalithic monuments) may have been construed not only as spaces emphasizing the collective over the individual (in which emerging individual interests were hidden, removed, or denied: Rojo Guerra et al., 2005: 234), but also as places for reinforcing male status and excluding females and children, who would not have had access to the rite of formal burial (Garrido Pena et al., 2012: 170). Conversely, it is important to bear in mind that no situation has been recorded where females represent a similar clear quantitative majority or are the object of an equivalent qualitatively superior distinction.

Although the Iberian Neolithic record does not provide quantitatively incontrovertible evidence of severe gender inequalities, numerous indicators point to the existence of an increasing dissymmetry and differentiation of social roles. The social space where this is most visible includes hunting and warfare, activities in which a growing association of males with violence becomes evident. In recent years, the study of violence in prehistory has expanded significantly (Duboscq & Gibaja Bao, 2016; Risch & Meller, 2017). However, with a few exceptions (for example Escoriza-Mateu, 2006; Schulting & Fibiger, 2012; Matic & Jensen, 2017), violence has rarely been analysed in terms of gender. This is in response, at least in part, to the misleading assimilation made on occasions between the terms 'gender' and 'woman', as remarked on by Cruz Berrocal (2009: 26), as well as the lack of interest in feminist and gender theory that part of the academic community continues to reflect. The results of our study highlight the importance of approaches that analyse the social construction of an image of masculinity based on the use and control of violence—a trend that becomes much clearer in the Bronze Age. In the Iberian Neolithic, there are statistically significant differences between the frequency of trauma identified on male and female remains, with the former showing more evidence of injury. At the same time, we also see males overwhelmingly represented in scenes of hunting and warfare (only males in the one instance of the latter) in the Levantine rock art of eastern Spain, in addition to the greater frequency of projectiles in male tombs at some sites.

Moreover, the anthropological record of several important sites suggests that in the Late Neolithic and Early Copper Age, more violent social conditions seem to have arisen: this is the case at San Juan Ante Portam Latinam (Vegas Aramburu et al., 2007) and the hypogeum of Longar (Armendáriz Martija et al., 1994). At the former site, with a total MNI of 338, thirteen individuals suffered arrow wounds, all of whom were males (Etxeberria Gabilondo & Herrasti Erlogorri, 2007: 220); at the latter site, with a MNI of 112, four individuals, all males, presented signs of impact and/or projectiles lodged in bones (Armendáriz Martija et al., 1994: 215). Furthermore, at several Portuguese sites (including natural caves and megaliths), the incidence of traumatic head injuries is ascertained to be higher among males (Silva et al., 2012: 338).

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This evidence of violence has been interpreted to be the result of processes of social change during the transition from Neolithic to Chalcolithic. Demographic pressure, territorial control, or confrontation over resources during a period of agricultural expansion and intensified livestock farming feature as explanations for the increase in social tensions leading to conflict and violence (Guilaine & Zammit, 2002). However, conflict is not only relevant in itself; it is also relevant insofar as it establishes a different social order whereby men became increasingly associated with the use and control of violence.

Conclusion

The study presented here has sought to contribute to a better understanding of the social transformations occurring in late prehistory. The creation of gender inequalities played an indisputable part in the appearance of social complexity, and it must be investigated and explained by prehistoric archaeology. In order to make such contribution, we have proposed an innovative analysis of gender relations in Neolithic Iberia by means of a holistic examination of the archaeological record. We contend that this analysis yields a reasonably promising and positive result, paving the way for a future robust understanding of gender inequalities in prehistoric Europe.

The analysis of the Iberian Neolithic archaeological record reveals four avenues to explore gender inequality as a social process: access to the rite of formal burial, the material conditions of existence, the appearance of specialized social roles, and a growing association of males with violence. Overall, the results of our study do not suggest the existence of widespread and/or acute gender inequalities in Neolithic society. There are, however, relatively clear signs of an increasing predominance of men over women. The quantitative prevalence of males in the funerary record points to a bias against females and children within the funerary ideology; males also overwhelmingly predominate in Spanish Levantine rock art, particularly in hunting and war scenes; males are more frequently associated with traumatic injuries and impacts by projectiles and, at some sites, they were buried with arrowheads far more frequently than females.

In Iberian Neolithic society we can observe the seeds of increasing social complexity and future gender inequalities. On the one hand, the communities do not seem to have experienced very advanced forms of social complexity, with highly hierarchical political systems. On the other hand, funerary practices suggest the existence of groups, collectives, and communities with more rights of access to material goods most likely associated with forms of leadership and power. Indeed, these forms of leadership are likely not 'sacred monarchies' such as have recently been proposed for the French Neolithic (Cassen et al., 2012; Jeunesse, 2017). The appearance of prominent leaders in the burial record, only just emerging in the Neolithic and Early Copper Age, does not become a recurring and unmistakable reality until the Bronze Age, after a gradual process (Rojo Guerra et al., 2005: 234–35; García Sanjuán, 2006). Our study suggests that the creation of differentiated gender roles and forms of gender inequality played a vital part in the emergence of social complexity, a factor which has not always been sufficiently understood.

Of all the variables considered in this study, those that show the clearest differences between males and females are related to violence: projectiles, trauma including impact by arrowheads, and graphic depictions of war and hunting. It is, in our view, difficult to attribute this to chance: rather, it shows the emergence of

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an ideology connecting males to the exertion of force. To what extent this ideology was linked to a process by which social status and the definition of leadership were beginning to be connected with warfare we cannot say. Our research has indeed failed to find evidence that 'high ranking' individuals were consistently males. Nor is it a question of understanding this difference through an essentialism whereby women are naturally peaceful while men are violent. Violence and aggressiveness, similar to many other emotions or cognitive responses, are, to a great extent, social constructions adapted to the material conditions of existence. However, there are hints that, during the Neolithic, the accumulation of power by males was both reflected in and encouraged by an emerging ideology, attested by the over-representation of men in burials and rock art scenes. Although this supports Lerner's (1990) study into the origin of the patriarchy, far more research along the lines presented here will be necessary to verify her hypothesis. Whether there ever was a 'patriarchy' in the third and second millennia in Iberia, like Lerner predicted for the Near East, remains to be established; but the Neolithic period seems to have laid the foundations for its emergence to take place.

Supplementary Material

To view supplementary material for this article, please visit https://doi.org/10.1017/eaa.2019.3.

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L'inégalité entre les sexes in Ibérie néolithique : une approche multidimensionnelle

Au cours des deux dernières décennies on a pu observer une croissance considérable dans les approches envers la problématique homme/femme en archéologie préhistorique récente dans la péninsule ibérique. Cependant, les travaux ont en grande partie porté sur des aspects spécifiques (pratiques funéraires, art pariétal), surtout de l'âge du Bronze et du Fer, époques pour lesquelles les données sont plus facilement disponibles. De plus, ces études ont surtout été conduites à une échelle régionale ou locale. Ici nous avons tenté de suivre une démarche solidement empirique et basée sur de multiples sources d'information dans le but d'éclairer l'évolution de l'inégalité entre les sexes à travers l'Ibérie néolithique. Inspirés par les idées de Gerda Lerner sur les origines du patriarcat et sur la base d'une récolte systématique des données analysées au moyen de tests de signification statistique, nous présentons la première étude exhaustive concernant les dissymétries entre les sexes en préhistoire ibérique. Nous en concluons en premier lieu qu'une approche multidimensionnelle présente des avantages potentiels pour l'étude systématique des inégalités entre les sexes sur la base de données archéologiques et, en second lieu, que c'est à l'époque néolithique que ces inégalités ont émergé et que se sont établies les fondations d'une domination masculine ultérieure. Translation by Madeleine Hummler

Mots-clés: Néolithique, Ibérie, inégalité entre les sexes, bio-archéologie, pratiques funéraires, art pariétal, tests de signification statistique

Geschlechtsspezifische Ungleichheiten im neolithischen Iberien: ein Multi-Proxy Ansatz

Die archäologische Geschlechterforschung in der späteren Urgeschichte Iberiens ist in den letzten zwei Jahrzehnten stark gewachsen. Die Untersuchungen haben sich aber meistens auf spezifische Aspekte (wie Grabsitten oder Felskunst) konzentriert, vor allem in der Bronze- und Eisenzeit, also in Bereichen, wo die Beweise leichter erhältlich sind. Außerdem sind diese Studien eher auf einer regionalen oder lokalen Basis durchgeführt worden. In der vorliegenden Arbeit verfolgen wir einen empirisch soliden Multi-Proxy Ansatz zum Verständnis der Entwicklung geschlechtsspezifischer Ungleichheiten im ganzen neolithischen Iberien. Inspiriert von den Ideen von Gerda Lerner über den Ursprung des Patriarchats und auf der Basis einer systematischen Sammlung von Daten, die mit Signifikanztestverfahren untersucht wurden, stellen wir hier die erste umfangreiche Studie in der iberischen Urgeschichte über die Missverhältnisse zwischen den Geschlechtern vor. Daraus schließen wir, erstens, dass eine Multi-Proxy Methode potenziell nützlich für die systematische Untersuchung von geschlechtsspezifischen Ungleichheiten im archäologischen Rahmen ist und, zweitens, dass diese Ungleichheiten sich im Neolithikum entwickelten und die Grundlagen für die spätere männliche Dominanz legten. Translation by Madeleine Hummler

Stichworte: Neolithikum, Iberien, geschlechtsspezifische Ungleichheiten, Bioarchäologie, Grabsitten, Felskunst, Signifikanzteste