

What a Mesh: Network Approaches to Nordic Bronze Age Identity and Regionality

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ABSTRACT

Through network explorations of identities in the Early Nordic Bronze Age (ca. 1700–1100 BCE), the assemblages from 5 169 burials published by Aner and Kersten (1973–2014) were investigated for gendered structural patterns. The study found a normative gendered division in the Early Nordic Bronze Age of female and male spheres. The analyses also found a strong overall homogeneity for the identity expression of both men and women; however, this homogeneity could be unfolded by targeted analyses of specific object type combinations for both women and men. This scalar approach allowed for a focus on individuals with ‘non-normative’ grave goods as well as an overarching view of

the total dataset, thereby providing a nuanced understanding of the diversity within and between the normative gendered structures. These ‘non-normative’ individuals provide the basis for the discussion of gendered symbols of power. The dagger and diadem are proposed as signs of high-status women and markers of differentiated social power. The folding chair is argued to represent political, religious and military leadership connected to male status. Finally, the identification of male individuals buried with the full weapon assemblage of sword, spear and axe points to an expression of male high social status regionally rooted in Northern Germany.

Keywords: Nordic Bronze Age, Networks, Identity, Gender

ZUSAMMENFASSUNG

Mithilfe von Netzwerkanalysen wurden die von Aner und Kersten (1973–2014) publizierten Grabinventare von 5 169 Bestattungen der Frühen Nordischen Bronzezeit (ca. 1700–1100 BCE) auf geschlechtsspezifische Muster untersucht. Als Resultat ergibt sich eine normative geschlechtsspezifische Aufteilung in eine weibliche und männliche Domäne. Die Analysen zeigen, dass die Identität von Männern und Frauen durch starke Homogenität geprägt waren. Durch gezielte Analysen spezifischer Objekttypen-Kombinationen können jedoch sowohl bei Frauen als auch bei Männern Brüche in dieser Homogenität aufgedeckt werden. Dieser skalare Ansatz ermöglicht sowohl eine Fokussierung auf Personen mit »nicht-normativen« Grabbeigaben als auch eine übergreifende Betrachtung des

gesamten Datensatzes und damit ein nuanciertes Verständnis der Vielfalt innerhalb und zwischen den normativen Geschlechterstrukturen. Diese »nicht-normativen« Individuen bilden die Grundlage für die Diskussion der geschlechtsspezifischen Machtsymbole. Der Dolch und das Stirnband werden als Zeichen für Frauen mit hohem Status und als Marker für differenzierte soziale Macht vorgeschlagen. Der Klappstuhl steht für politische, religiöse und militärische Führung, die mit einem männlichen Status verbunden ist. Schließlich verweist die Identifizierung männlicher Individuen, die mit dem kompletten Waffensatz von Schwert, Speer und Axt bestattet wurden, auf einen spezifischen Ausdruck eines hohen sozialen Status von Männern in Norddeutschland.

Schlagwörter: Nordische Bronzezeit, Netzwerke, Identität, Geschlecht

INTRODUCTION

The following study examines gender, identity and regionality in the Early Nordic Bronze Age (ca. 1700–1100 BCE), based on an assemblage of 5169 burials (SI 1) from the archival record contained in catalogues collated by E. Aner and K. Kersten (1973–2014) (Fig. 1). The burials are investigated through relational approaches by applying formal network analyses with the aim of understanding the relationships between expressions of gender, identities and regionality within the Nordic Bronze Age culture. The study will tack between a large-scale view based on information from the total dataset and more detailed insights into individual graves of particular interest (Fig. 2).

In archaeology, identity is studied through the material culture. In the Oxford Dictionary of English, identity is defined as: “1) the characteristics determining who or what a person or thing is. [...] 2) A close similarity or affinity” (STEVENSON 2010). This study argues that artefacts hold meaning by being intimately linked to people of the past, however recognising that material culture does not simply reflect pre-existing forms of identity (BRÜCK 2004; FOWLER 2005). Identities (past and present) are socially constructed and shaped through our interactions in life (FOWLER 2004, 4). The study of burials thus enables an insight into past identities, albeit with difficulty distinguishing between individual identities and group identities that are both defined by the material expressions in the burials (LILLEHAMMER 1987). Therefore, the individual burials in this study are examined through networks of object entanglements. Identity is thus studied through relations of affinities. It is expected that the expressed identities will be detected on a group level with the possibility of identifying potential individuals that fall outside the expressed norms.

Previous studies have provided valuable insights into these matters by studying appearance as an expression of identity with relevance for an understanding of social belonging within a group (JOCKENHÖVEL 1991; SØRENSEN 1997; 1991; WELS-WEYRAUCH 1989 a).

Gender is an integral part of a person’s identity. The Nordic Bronze Age is defined by two normative gender categories that most likely correspond to the biological sexes of female and male (BENNIKE 1985; FREI et al. 2019). As bone preservation is generally poor for the Early Nordic Bronze Age, a gender categorisation based on the type and composition of grave goods is typically the only option. Here, jewellery is regarded as the primary marker of females and weapons most likely represent males (MÜLLER 1891, 1–65). This hypothesised gendered division based on grave inventory is seen throughout the Nordic Bronze Age (BERGERBRANT 2007, 44–91; GIBBS 1987; KRISTIANSEN

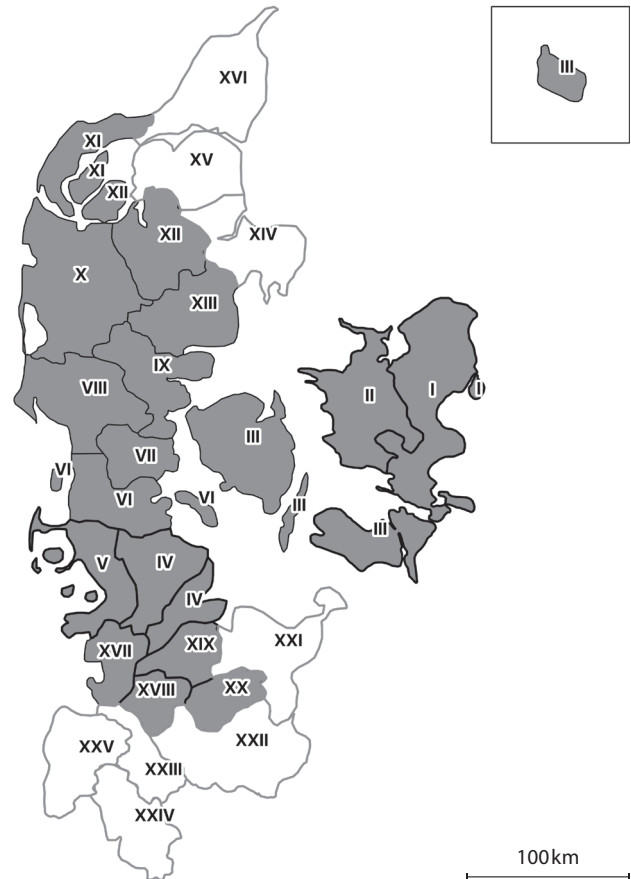


Fig. 1. The Cimbrian Peninsula with the Danish isles, showing local districts in Denmark and Northern Germany. The numbering corresponds to the volumes of E. Aner and K. Kersten (1973–2014): Grey – published; white – planned (Graphics: authors).



Fig. 2. The Cimbrian Peninsula with the Danish isles, showing sites discussed in the text (Graphics: authors).

1974; 1981; 2011; RANDSBORG 1986; SØRENSEN 1992; 1997) and is also recognised in the wider context of Bronze Age Europe (TREHERNE 1995; REBAY-SALISBURY 2017; WEGLIAN 2001; WELS-WEYRAUCH 1989 a; 1989 b; KNIPPER et al. 2017; MITTNIK et al. 2019).

In a Nordic context, the uniquely preserved oak coffin burials provide detailed insights into the gendered appearance of the period, with marked differentiation between the two observed gender categories in costume and appearance (THOMSEN 1929; BROHOLM/HALD 1939; 1940; BERGERBRANT 2007, 44–91; BOYE 1896; GLOB 1970; JENSEN 1998).

The Nordic female gender is traditionally defined by the presence of the following artefacts: belt plates, neck collars, neck rings, arm rings, tutuli and hair rings (KERSTEN 1936, 8; MÜLLER 1891, 47–65). The Nordic male gender category is, in comparison, traditionally defined by the presence of swords, axes, spears and daggers (KERSTEN 1936, 8; MÜLLER 1891, 1–46). Both normative gender categories share several artefact types such as fibulae, pins, arm rings, knives and daggers (KERSTEN 1936, 8).

This study sets out to demonstrate the norm of the gendered Nordic Bronze Age society, yet it also seeks to identify individuals that fall outside this norm, as every non-normative individual presents a case for alternative gender categories and perceptions. This enables a comparison between observable genders, which then allows for a study how these were articulated and used strategically in different contexts (SØRENSEN 1992, 36; WEGLIAN 2001; DAROCZI 2017; FIALKO 2017).

The study of regionality in relation to identity has previously been investigated through object-type-combinations that point to different choices of gendered style and appearance across regions in the Nordic Bronze Age (ASINGH/RASMUSSEN 1986; 1989; 1990; BERGERBRANT 2007, 65–84). The study of ornament details further indicates regional metal workshops based on style preferences and craft techniques (NØRGAARD 2015; 2018; RØNNE 1986). This study draws on several of these aspects and through network analysis expands the scope by incorporating all burials from the volumes published from 1973–2014 in the catalogue series *Die Funde*

Table 1. Overview of study data. Count based on information from registers only (ANER/KERSTEN 1973–2014).

Burial gender	Count
Female	576
Male	2690
Child	23
Mix Female Male	80
Mix Female Male Child	1
Mix Female Child	2
Mix Male Child	0
Uncategorised	1797
Total Burials	5169

der älteren Bronzezeit des nordischen Kreises in Dänemark, Schleswig-Holstein und Nordniedersachsen (ANER/KERSTEN 1973–2014) (Fig. 1). The Aner and Kersten catalogues list finds from the area corresponding to present-day Denmark and Northern Germany. Each of the volumes corresponds to a Danish Amt or a German Kreis, administrative subdivisions broadly equivalent to counties in the Anglosphere. This division provides a broad regional dimension to this study for a large-scale perspective, as this scale of analyses did not allow for extraction of geographical location of each individual burial.

The 5 169 burials make the largest dataset (Table 1; Suppl. 1) of Nordic Bronze Age burials that has been analysed to date with a relational methodology and was achieved through digitising and parsing relational data from the indexes of the catalogues. This holds great potential for the study of gender, identity and regionality, and demonstrates the feasibility of using data from catalogue indexes as an accessible means of providing an extensive corpus of high-level relational data for such analyses. The overall aims are therefore to investigate the meaning and content of expressed gender identities, to examine how identity is expressed in the burial assemblages across regions, and to evaluate the variations within and between gendered categories in the Nordic Bronze Age.

MATERIAL AND METHODS

Data extraction

Each context for the finds in the volumes is given a unique number as an identifier, henceforth referred to as the “Aner/Kersten identifier” or AKID. The volumes are indexed using four distinct registers. *Fundorte* provides a lookup between parishes, place names and the AKID; *Flur- und Grabhügelnamen* links the AKID to

the names of specific archaeological features such as barrows; *Museen und Sammlungen* locates the material in museum collections; finally, *Sach und Typenregister* lists different artefact types, contextual data and the AKIDs containing them. For the relational approach undertaken in this study, only the latter is considered.

This register is comprised of an alphabetical list of types, with sub-types denoted by a preceding ‘—’ or em dash. After each type or sub-type follows a list of AKIDs and associated information. In general, this is the page number, followed by a left parenthesis, followed by the AKID. If there is a national registration number, this follows the AKID and a comma. If the context is a sub-division of an AKID, this is denoted by an upper-case letter or Roman numeral after the AKID or registration number, separated by a space. If more than one type is found on the same page, these are included within the parentheses, separated by a period. While this pattern varies slightly between volumes, the consistent and formal structure of the registers means it is possible to extract this data by a set of automated operations.

To achieve this, the registers were scanned and the text was extracted using Optical Character Recognition (OCR) of the ‘FreeOCR’ software package (www.paperfile.net, v5.4 March 2015). The information from the resulting text files was then structured using the Python programming language and then used to produce JSON (JavaScript Object Notation) files using each AKID as an object containing lists of types and reference information. This process was complicated slightly by minor inconsistencies in registration practices and errors in the OCR process. Mitigating these required multiple validation methods to detect and correct errors.

The JSON files for each volume were collated and used to produce a list of unique properties. This highlighted that in addition to the OCR errors, classifications and terminology vary between volumes. For example, an amber bead is recorded as *Bernstein*

—*Bernsteinperle* (Volume XIII), *Bernstein —Bernsteinperle(n)* (XII and XX), *Perle —Bernstein* (XIX), *Perle —Bernsteinperle(n)* (XI), and *Perle —Bernsteinperle* (I, II, III, IV, V, VI, VII, VIII, IX, X, XVII and XVIII). To correct this, these types were mapped to a single type. In the example, above this *Perle —Bernstein* would be listed. These types were mapped to a supercategory to produce a categorisation surmising objects such as swords or armbands with numerous subcategories. In total, the scanned dataset contained 1 203 entries. These were condensed by the mapping process to 564 unique classifications after resolving OCR errors and overlapping classes. In turn, these were mapped to 215 supercategories. The mappings are included in the supplemental information (Suppl. 2). These mappings were then used with the collated JSON data to produce consistent data across volumes. Relations between contexts on the same site were added as parent and child relations between AKIDs.

Once a consistent collated dataset had thus been derived, extraneous data not relevant to this study was removed. First, to exclude stray finds and votive deposits, only graves were selected. Second, to exclude graves from other periods, only those containing objects of types diagnostic of the Early Nordic Bronze Age periods I–III (ca. 1700–1100 BCE) were selected. This filtered data-set (Suppl. 1) contains 10 828 objects belonging to 389 categories and 111 supercategories. Since many of the type names would be difficult to translate unambiguously and for reasons of consistency, we kept the original German designations in the database and most of the figures.

Network analyses

Network methods provide insights into complex data by offering a relational analytical approach on multiple scales with a high visual impact. The network methodology originates from graph theory and has been widely applied in the social sciences since the 1950s (HARARY/NORMAN 1953).

Network methods in archaeology have become increasingly popular over the last two decades¹. They have a wide range of applications allowing for analyses of both quantitative and qualitative data and for analyses on multiple scales. In archaeology, however, we operate with the caveat that the individuals we wish to study are dead and that social interactions are something we reconstruct from socio-material relationships (KNAPPETT 2016).

The socio-material background for this study is the burial assemblage for the Nordic Bronze Age (as published in the ANER/KERSTEN catalogues) and it is the premise for this study that these object relationships offer insights into the gendered social structures of Bronze Age society.

Network analyses can be presented as one-mode or two-mode networks, i.e., networks with one or two types of nodes. The different network types can shed light on different aspects of the research questions asked and both types are used in the analyses presented in this paper. Two-mode networks can be transformed into two one-mode networks with the potential to form clusters by similarities based on object type combinations. The data structure for the networks in this paper can be found in Table 2.

¹ AMATI et al. 2018; BOURGEOIS/KROON 2017; BRUGHMANS 2010; 2013; BRUGHMANS et al. 2016; COLLAR et al. 2015; HODDER/MOL 2016; KNAPPETT 2011; 2013; MARTIN 2020;

MILLS 2017; ÖSTBORN/GERDING 2014; PÁLSSON 2021; SIND-BÆK 2007; 2013; VERHAGEN et al. 2019.

Different network software and algorithms have been applied for the different analyses presented in this paper. The two-mode networks were produced in the network software Gephi (BASTIAN et al. 2009) using the force-directed Force Atlas and ForceAtlas2 algorithms (JACOMY et al. 2014). The one-mode networks were produced in the network software Visonne (BAUR et al. 2001), applying the triadic Simmelian backbone algorithm (NICK et al. 2013). Finally, geospatial mapping using geographical coordinates was applied for regional studies. The different algorithms applied in this study enable different analytical approaches to the data and will be presented in more detail below.

ANALYSES AND RESULTS

A network of Nordic Bronze Age burials

The two-mode network of the 5 169 burials in the dataset (Fig. 3) illustrates the predefined gendered division in Bronze Age society and the interrelations of the associated artefacts in the graves. This visual representation provides the possibility to investigate gendered social structures and social roles based on artefact associations.

The nodes in the network (Fig. 3) are represented by graves and artefacts (see Table 2 for data structure). The applied ForceAtlas layout algorithm (JACOMY et al. 2014) is a continuous force-directed layout providing a linear attraction, linear repulsion model. Here, linked nodes are attracted to each other and unconnected nodes are pushed apart. The network visualisation in Figure 3 represents a balanced state of these effects. The node placement in the network can only be read and understood in relation to other nodes. Furthermore, no other attributes apart from artefact type were taken into account when calculating node similarity. The size of the node is based on degree, where the size of the node is determined by the number of edges it is linked with, i.e. in Figure 3, the more graves found with a sword, the bigger the sword node will be rendered.

The sword demarcates and dominates a masculine area of the network, and is found in the same area where we also see the spear and the axe. The dominance of these three artefacts groups in Nordic male Bronze Age graves has been explored by L. FELDING and colleagues (2020), who detected the same pattern on a regional scale, with implications for our understanding of male role division relating to Bronze Age warfare and expressions of male masculinity. Other artefacts found in the masculine sphere are: belt hooks, fire lighting equipment, razors, tweezers, chapes and sheaths.

Table 2. Data structure for the networks in this study.

Network Structures		
Figure	Source	Target
3	Burial (AK ID)	Artefact (main category)
4	Catalogue volume	Artefact (supercategory)
5 a–b	Burial (AK ID)	Artefact (main category)
6	Catalogue volume	Artefact (main category)
7	Burial (AK ID)	Artefact (supercategory)
9 a–b	Burial (AK ID)	Artefact (main category)
10	Catalogue volume	Artefact (main category)
11	Burial (AK ID)	Artefact (main category)

The feminine area of the network is less pronounced due to the relatively low number of female gendered burials. However, this is not regarded as representative of Bronze Age society, but rather as a result of taphonomic issues related to the better preservation of swords allowing for the larger number of gendering of these graves. A clear feminine presence is, however,

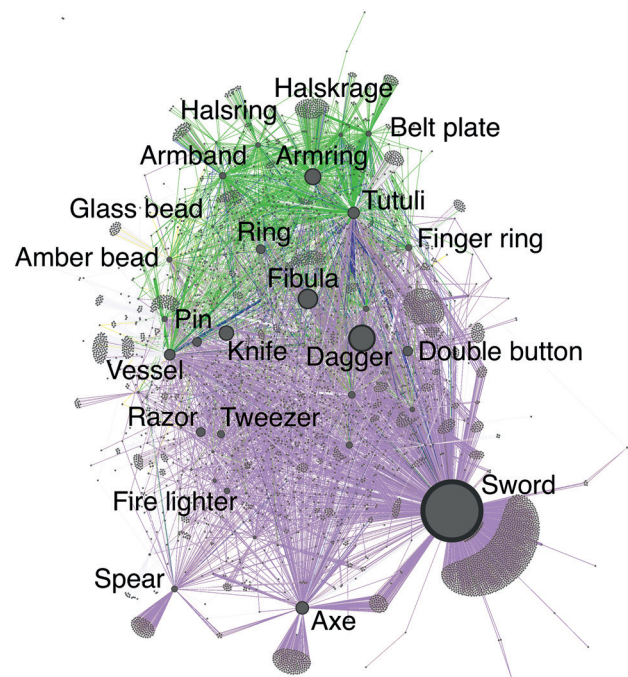


Fig. 3. Two-mode network based on 5 169 burials registered in the catalogues by E. Aner and K. Kersten (1973–2014). Nodes represent burials and artefacts; only selected artefacts are labelled. Edge colour by gender: Purple – male (n=2 690); green – female (n=576); blue – mixed burials (n=83); yellow – child (n=23); white – not categorised (n=1 797). Layout: ForceAtlas; software: Gephi (Graphics: authors).

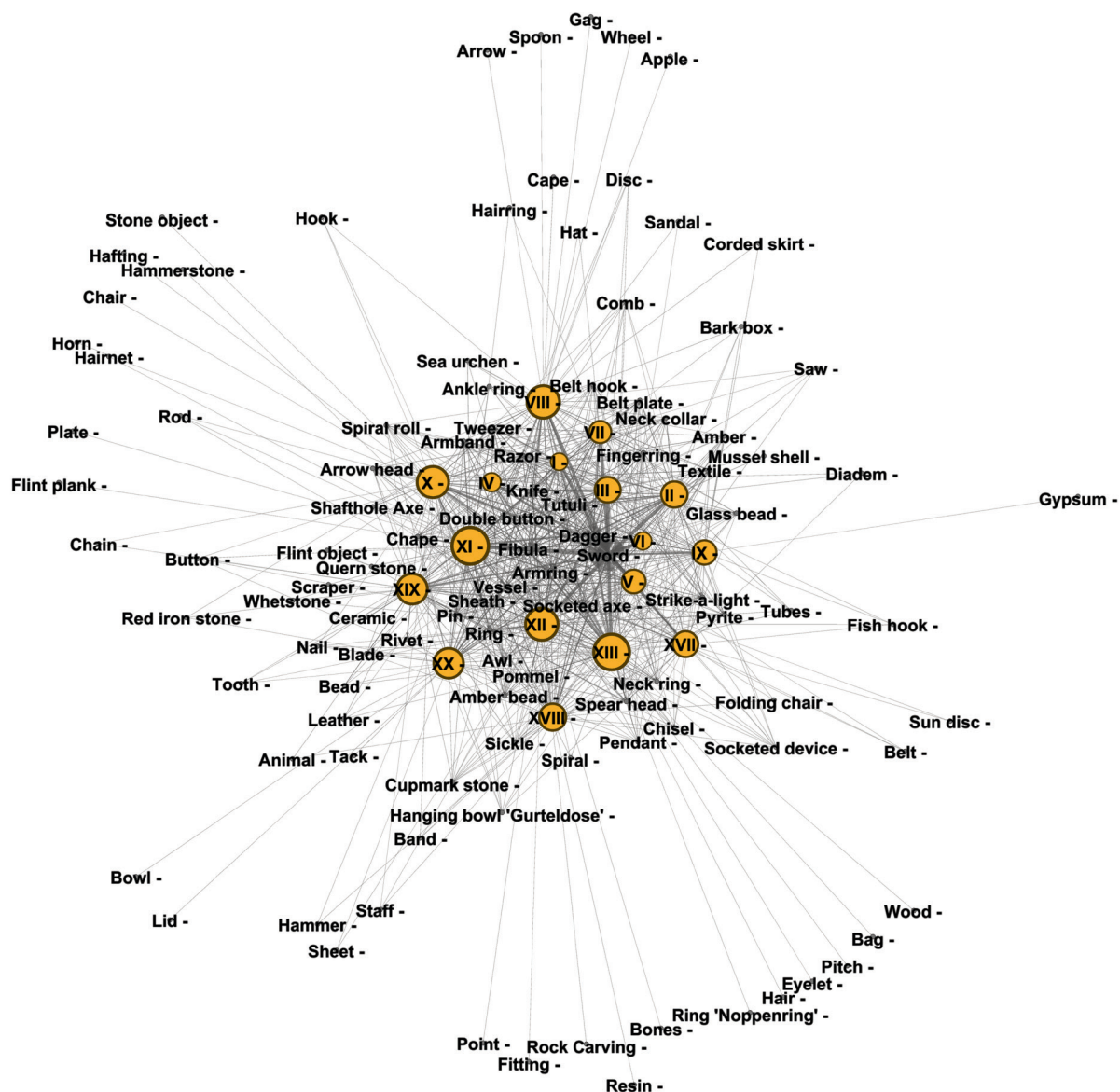


Fig. 4. Two-mode network of artefacts (supercategories) seen in relation to Aner and Kersten volumes providing a regional perspective on the Nordic Bronze Age. Node size by degree. Layout: ForceAtlas2; software: Gephi (Graphics: authors).

noticeably marked by jewellery: rings, arm rings, arm-bands, neck rings, neck collars, amber beads, glass beads and belt plates. The arm ring is especially well represented in the female area of the graph.

In between the feminine and masculine areas of the graph, we find non-gender specific artefacts

such as knives, daggers, pins, fibulae, finger rings, tutuli and vessels. These form an important part of the material expression of personhood in the Nordic Bronze Age without being labelled as 'gender markers'.

Artefacts and regionality in the Nordic Bronze Age

In order to investigate regional expressions of identity, an overall regional network was made showing artefacts from all the burials in relation to the ANER/KERSTEN catalogue volume in which they are registered (Fig. 4). The nodes in the two-mode network represent artefacts

and catalogue volumes (see Table 2 for data structure). The network layout has been created by a force-directed layout algorithm (ForceAtlas2) applying a linear attraction, linear repulse model as described above. The node size in the network is created by out-degree, following

the sample principles as describe above, rendering node volumes with many artefact categories larger than volumes with fewer artefact categories.

The network demonstrates a uniform Nordic identity in the Bronze Age based on the many artefacts that are placed in the centre of the graph. These artefacts represent already recognised objects defining the Nordic Bronze Age culture such as: Rings (arm-, finger- and neck rings), beads, chapes, knives, pins, swords, daggers, axes, tweezers, razors, tutuli, spiral rolls, belt hooks, fibulae, belt plates, double buttons, vessels, strike-a-lights, chisels and sickles. All these 'artefact nodes' appear in the middle of the graph surrounded by 'catalogue nodes' because they occur widely across the ANER/KERSTEN volumes (i.e. regions). The large group

of objects in the centre of the graph is the 'make up' for the material expression of a 'Nordic identity'.

Rare objects are seen as satellite nodes connected to certain volumes and signs of regional traits and extraordinary occurrences. Thus, rarer objects, such as folding chairs, hair rings, mussel shells, diadems, saws, sandals and red iron stone, are found in the network periphery².

The regionality graph demonstrates the core of the Nordic Bronze identity as expressed through shared inter-regional artefact types, but offers no possibility to investigate gender in relation to regionality or identity. In order to pursue such inquiries, one-mode networks of objects from female and male gendered graves were created (see below).

Gendered networks

Three different types of one-mode network analyses with different scope were applied in order to investigate female and male social roles, identity and regionality in the Nordic Bronze Age society. The analyses are based on the material from 576 female and 2690 male gendered burials. The network analyses investigate identity and regionality through a series of different one-mode networks created in the software Visone (BAUR et al. 2001).

Gendered identities

The one-mode gendered networks provide the possibility to investigate and compare expressions of identity between the two normative gender categories in the Nordic Bronze Age.

The analyses focused on identity applied by the 'Simmelian triadic backbone' layout algorithm. At the core of this application is the triadic nature of social formation allowing third parties to inform us about social dyadic relationship. Central to this thought is that the formation and survival of group identity is stronger and longer lasting than individual identity (KRACKHARDT/HANDCOCK 2007). The algorithm is used in order to untangle network 'hairballs' by detecting communities that are formed by strong – and thereby highly redundant – ties between members (NICK et al. 2013). The backbone layout is based on spanning a sub-graph that consists of strong ties based on embeddedness (meaning establishing ranked neighbourhood comparisons). When drawing the graph, the algorithm thus favours edges based on their triadic structural embeddedness ('Simmelian

ties' within a triangle of neighbours), yet maintaining the connectedness across the network (NICK et al. 2013; NOCAJ et al. 2015). This method has been found useful for the detection of communities in networks with insufficient variation in local density for standard approaches to work (NICK et al. 2013).

The variation of expressed identities in *burials* is based on shared artefact types and can be found in the networks (Fig. 5a; 8a). The similarities in these networks (groups and clusters) are viewed as signs of group identities. The colouring of the nodes in the networks according to the Aner/Kersten volume provides a regional dimension. The graphs allow the investigation to study gendered identity expressions in the Early Nordic Bronze Age and to identify whether these identities are regionally contingent. Outliers are seen to represent individuals who stand out from the norm, either because of the rarity of their artefact assemblages, which can point to status, social role or mobility. However, taphonomy and the fragmented nature of the archaeological record can also be the cause of some outliers.

The variations (or lack thereof) between individual burials were subsequently analysed from a material perspective (Fig. 5b; 8b). Here *artefacts* are grouped by their co-appearance in graves. These object networks allow for the evaluation of the content and variation of the expressed gendered identities by analysing what artefact types are commonly found together to establish the norm against which outliers can be understood. The networks thus provide us with the opportunity to investigate expressions of identity based on preferred object-type combinations in the Nordic Bronze Age. These results will be discussed in more detail below.

² Some rare objects could perhaps have been grouped (e.g. Scraper/Flint objects or Bowl/Vessel/Cup/Ceramic or Rod/Staff or Bones/Animal) in order to provide a clearer picture,

but it is held that this would not have altered the overall picture or interpretation.

Gendered regionality?

Regionality was investigated through analyses of one-mode networks illustrating the degree of co-occurring artefacts across regions (defined as AK volume nodes). The network layout is based on a geographical layout using map coordinates for each catalogue node placed in the area of the respective volume (Fig. 6; 10). One important bias in this layout is the misrepresentation of the geographical placement of catalogue volume III that apart from Funen (where the node is placed) also includes areas of southern Zealand, Falster, Lolland and Bornholm. Bearing this in mind, the graphs provide interesting observations on regionality in the Early Nordic Bronze Age. The edge colour in these graphs is visualised by multiplicity (darker colour = more multiplied links).

The gendered regional networks allow for the evaluation of how homogeneous the expressions of identity are across regions, where close connections are based on shared artefact types between them. The networks demonstrate how different regions are linked by the number of shared artefact types that they have in common. However, the network does not allow for an evaluation of which artefact types are shared between them, as these are not shown in the network. Here we draw on the information from the overall regional network graph (Fig. 4).

Female networks

The female network a (Fig. 5a), based on the 576 gendered females, demonstrates a very homogeneous social female group identity in the Nordic Bronze Age.

The norm dominates the centre of the graph, with moderate clustering in the periphery. Some outliers are present, representing individuals with a more singular expression than the norm. These singular expressions are the results of unique grave goods combinations. A few examples of burials seen as outliers in the network include (see also Fig. 2):

- Ke 2012C Hesselager, Svendborg Amt (ANER/KERSTEN 1977, 160), a woman buried with an awl, small spiral rolls (originally attached to woollen thread), three blue glass beads and a ceramic vessel.
- Ke 3485 Lille-Nustrup, Haderslev Amt (ANER/KERSTEN 1984, 56), a woman buried with a full-hilted dagger (incl. chape) and an armband with decorations.
- Ke 3963 Nyby, Ribe Amt (ANER/KERSTEN 1986, 75), a woman buried with a belt plate with circle ornamentations (presumed ‘*Buckel*’ ornamentation).
- Ke 9924 Kaltenkirchen, Kreis Segeberg (KERSTEN et al. 2011, 111), a woman buried with a tutuli (‘*Gürtelbuckel*’) and two armbands of the same type but with different ornamentation styles.
- Ke 10004 Wensin, Kreis Segeberg (KERSTEN et al. 2011, 147), a woman buried with a gold spiral ring, three glass beads and two amber beads.

However, as the analyses are based on the fragmented nature of the archaeological assemblages and do not differ between disturbed graves, graves with poor preservation or intact graves, often the fragmented graves will appear more unique as the

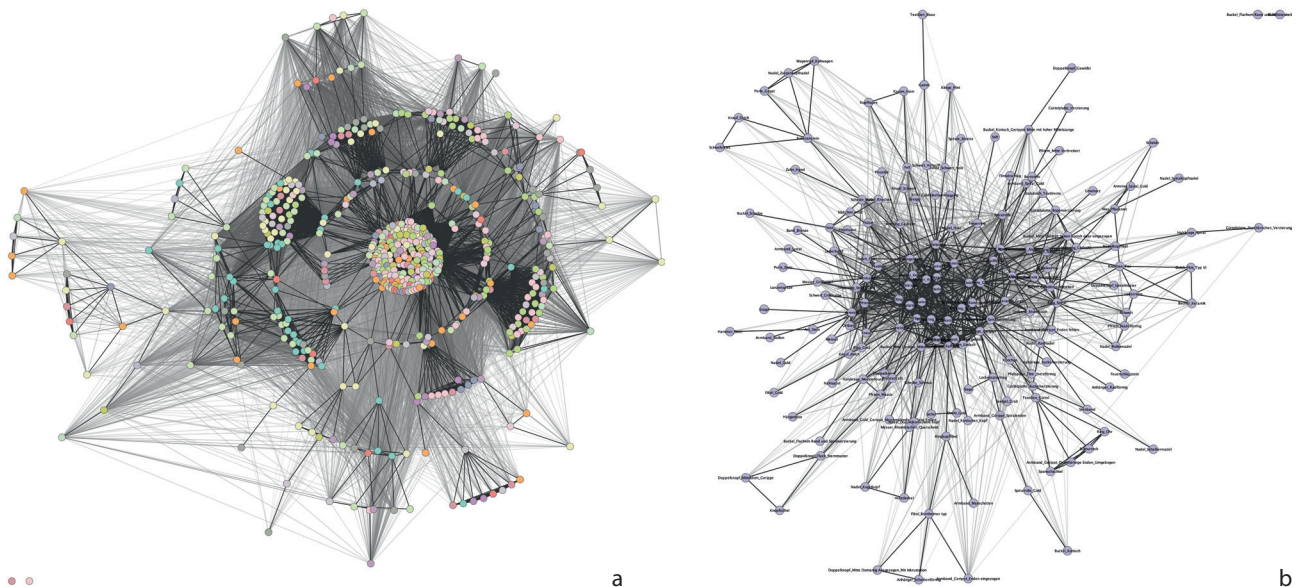


Fig. 5. One-mode networks of female graves (n = 576): a – Grave similarity based on number of shared artefact types, node colour by Aner and Kersten volume; b – network of artefacts based on co-appearance in female graves. Layout: a–b – Simmelian Triadic Backbone (Graphics: authors).

object types ‘stand alone’ and are not pulled towards the centre by accompanying ‘normative’ grave goods.

The node colour (by region) indicates that the clusters are mixed with individuals from across the Nordic Bronze Age regions and thus the burial clusters seem connected to social role or status instead of regional demarcation of appearance. The Nordic social identity viewed purely on the basis of object type combinations is therefore regarded as uniform, with the possibility that regional demarcation of localised traits at the individual level are not visible at this scale of analysis.

Network b (Fig. 5b) demonstrates a strong core of often co-appearing artefact types in Nordic Bronze Age female graves with peripheral spread but no strong group formations. The peripheral spread represents unique and rare object and object combinations pointing to another expression of social identity than the ‘Nordic norm’ represented in the centre. Some of these artefacts are regionally distinctive pointing to supra-regional connections with the Central European Tumulus culture.

These ‘different’ social identities are recognised by the presence of unique artefacts, such as special pin types (e. g. *Zargenkopfnadel*, *Radnadel* and *Scheibennadel*), certain armbands (such as the *Stollenarmband*), certain tutuli (such as the *konischer Buckel*), jet beads, red ironstone (hematite), animal teeth, belt plates with special decorations (*durchbrochene Verzierung*), hair rings, diadems, gold jewellery and finally swords.

Two female burials are registered with a sword, truly indicating their exceptional status: Ke 299 Ølby, Københavns Amt (ANER/KERSTEN 1973, 95) and Ke 4629A Vorgod, Ringkøbing Amt (ANER/KERSTEN 1995, 13) (Fig. 2). These women will be highlighted in the discussion of gendered social roles in the Nordic Bronze Age along with two other female burials found with non-normative items: the Tobøl woman (ANER/KERSTEN 1986, 64 Ke 3919B; Thrane 1962) and the Bustrup woman (ANER/KERSTEN 2008, 286 Ke 6283A) (Fig. 2). Together with those found with diadems, these women will form part of the general discussion of non-normative Nordic artefacts and their implications for our understanding of structured gendered social roles.

Network c (Fig. 6) demonstrates the interconnectedness between regions based on the co-appearance of artefacts in female graves. It is clear that the overall picture is one of a very well-connected network across all the regions. However, it is also clear that some regions are more interconnected than others indicating some regional differences in the Nordic Bronze Age. These differences are detected in this network based on the number of shared

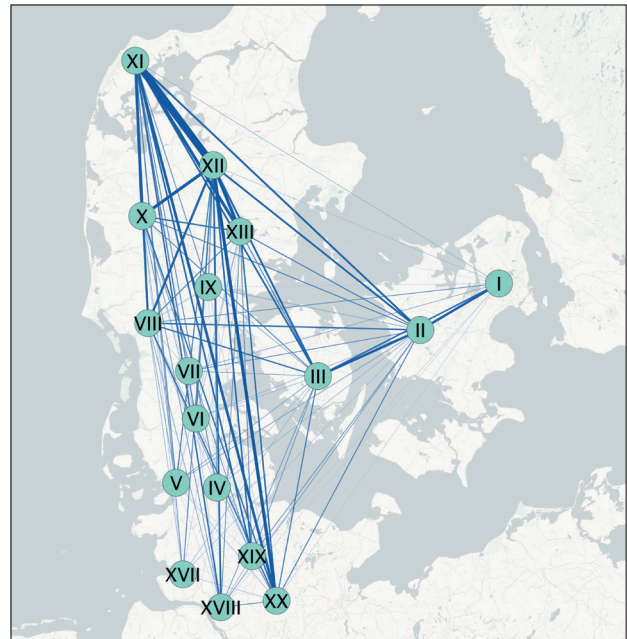


Fig. 6. One-mode networks of female graves (n = 576): Interconnectedness of Aner and Kersten catalogues based on shared artefact types (note that the node for volume III has geographically been placed on Funen but in reality is also comprised of areas on South Zealand and Bornholm; see Fig. 1 for geographical overview of volumes). Geographic (mercator), edge colour by weight (multiplicity); software: Visone (Graphics: authors).

artefact types. The more connections the darker the line (created by multiplicity). The network thus indicates some strongly connected regions within the Nordic Bronze Age, indicating frequent communications, and other weaker connected regions with fewer similar grave goods types indicating less frequent contacts. Less connected regions could be the indicator of more localised traits but could also be the result of a core-periphery relationship within the Nordic Bronze Age.

It is noticeable that there is a strong similarity of shared artefacts in female gendered graves across the whole study area but particularly noteworthy are the strong ties between the (Northern) Jutland peninsula (volumes XI and XII) and the northern German area (volumes XIX and XX).

Adornments

In order to investigate the social status related to the dagger as a sign of female religious and political power as suggested by F. Kaul and J. Varberg (2017, 380) as well as H. MÜLLER-KARPE (2009, 161), a targeted network of adornments (including the dagger) was produced (Fig. 7). The following adornments were chosen for analyses: Armbands, arm rings, neck

rings, ankle rings, belt plates, pins, diadems, amber beads and glass beads. However, all graves containing one or more of these adornments were included, allowing for a gendered perspective. The network is comprised of a total of 1 940 burials.

The network is a two-mode network produced in the software Gephi by applying a force-directed layout algorithm (ForceAtlas2) using a linear attraction, linear repulse model as previously described above. The network clearly demonstrates a gendered division, where the dagger in male graves is associated with amber beads and pins and most commonly only with one of these. Daggers in female graves, however, are mostly associated with belt plates, armbands, arm rings and neck rings. The graph shows that the dagger is interconnected with rich female burials, often in association with several of the adornment categories central to the expression of the ‘Nordic identity’. Some groupings are noticeable in the network, indicating varied expressions of status, rank and identity related to the combination of adornments worn with the dagger. The groupings do, however, indicate that the dagger is most commonly found together with one or two artefact types (typically the arm ring, neck ring or belt plate).

Diadems

A survey of the 5 169 graves analysed from the Aner/Kersten registers revealed six graves with diadems (Table 3) of which three were female graves. It is clear that the diadem is not part of the standard attire for Nordic Bronze Age women as the burial assemblages in two cases also included spoke wheel headed pins (*Radnadel*). The female graves with diadems are therefore regarded as *Fremde Frauen*, women with personal belongings that were not common in the area where they were buried (JOCKENHÖVEL 1991). Instead, these diadems and spoke wheel headed pins point towards connections with Northern Germany, Central Europe, the Carpathian Basin and perhaps even with links to Mycenae (KERSTEN 1936, 31; SCHUMACHER-MATTHÄUS 1985, Karte 37; VANDKILDE 2014).

The female grave from Smidstrup Hovedgård (ANER/KERSTEN 1976, 175 Ke 1264 A) contained both a diadem and a spoke wheel headed pin (Fig. 8) hypothesised to be of Lüneburg origin. The grave was compared to a burial from Wardböhmen in Niedersachsen (Schalfstallberg, mound I grave II) that also appeared with a similar diadem (BERGERBRANT 2005, 166; LOMBORG 1969, 131).

The only known Swedish example of a diadem from the Bronze Age as mentioned by S. BERGERBRANT (2007, 112) is the Abbekås mound nr. II grave 2/4 that contained a bronze diadem found with an individual estimated to be 8 years of age.

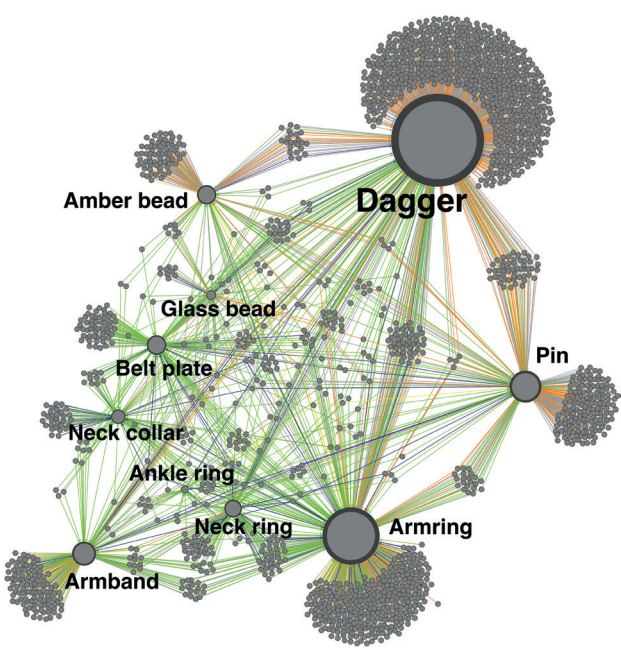


Fig. 7. Targeted network of selected burials (n=1940) with adornments seen in relation to the dagger. Edge colour by gender, node size by degree. Layout: ForceAtlas2; software: Gephi (Graphics: authors).

Table 3. Bronze Age graves with diadems (*Stirnband*) in the Aner and Kersten catalogues (1973–2014). For geographical location see Figure 2.

Catalogue nr (Ke)	Gender	Date	Catalogue Volume
1130	Male	NBA I	II
1250	No gender	NEBA	II
1264 A	Female	NBA II	II
1271	No Gender	NBA II	II
4679	Female	NEBA	XV
9005 B	Female	NBA II	XVII

Male networks

Male social roles, identities and regionality in the Bronze Age are examined based on network analysis of 2 690 male gendered burials (Fig. 9–10). The dataset was investigated through the Simmelian triadic backbone layout algorithm (Fig. 9 a.b) and geographic mapping (Fig. 10) as already presented above. The methodological caution related to the fragmentary nature of the archaeological assemblages therefore still applies.

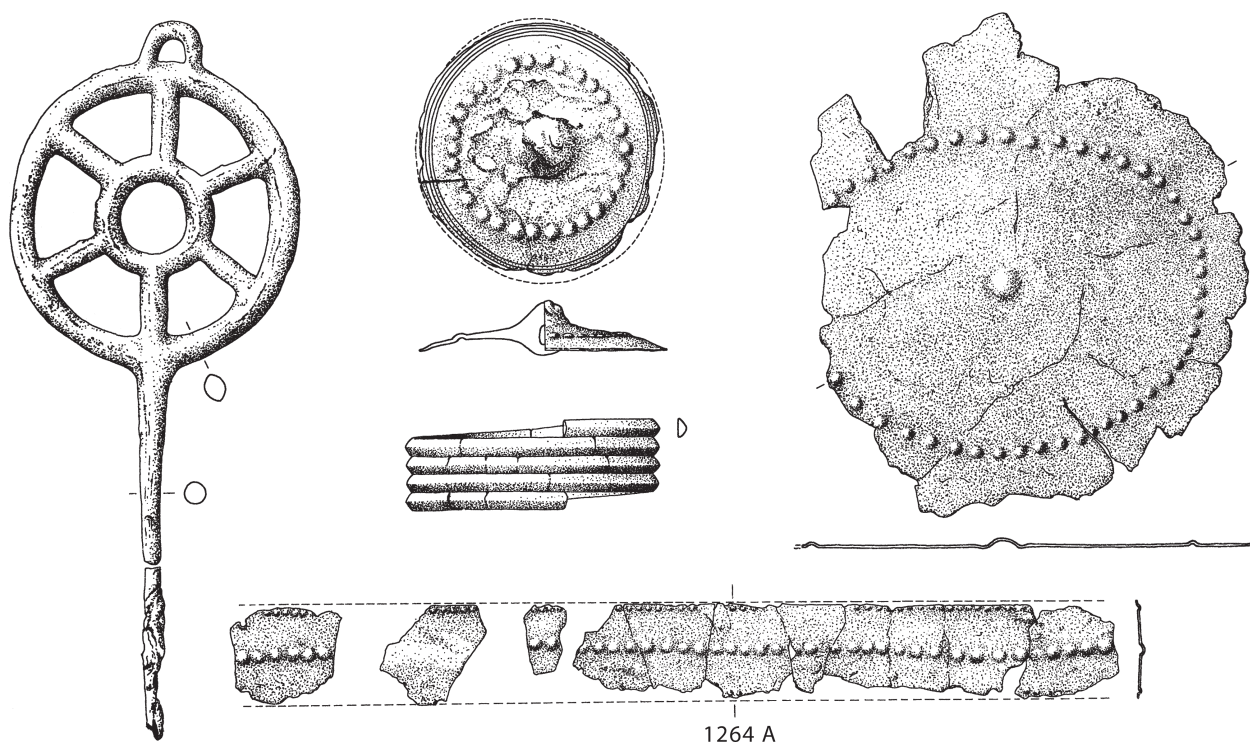


Fig. 8. Diadem and associated grave goods from the female burial Smidstrup Hovedgård (Ke 1264 A) (after ANER/KERSTEN 1976, pl. 110).

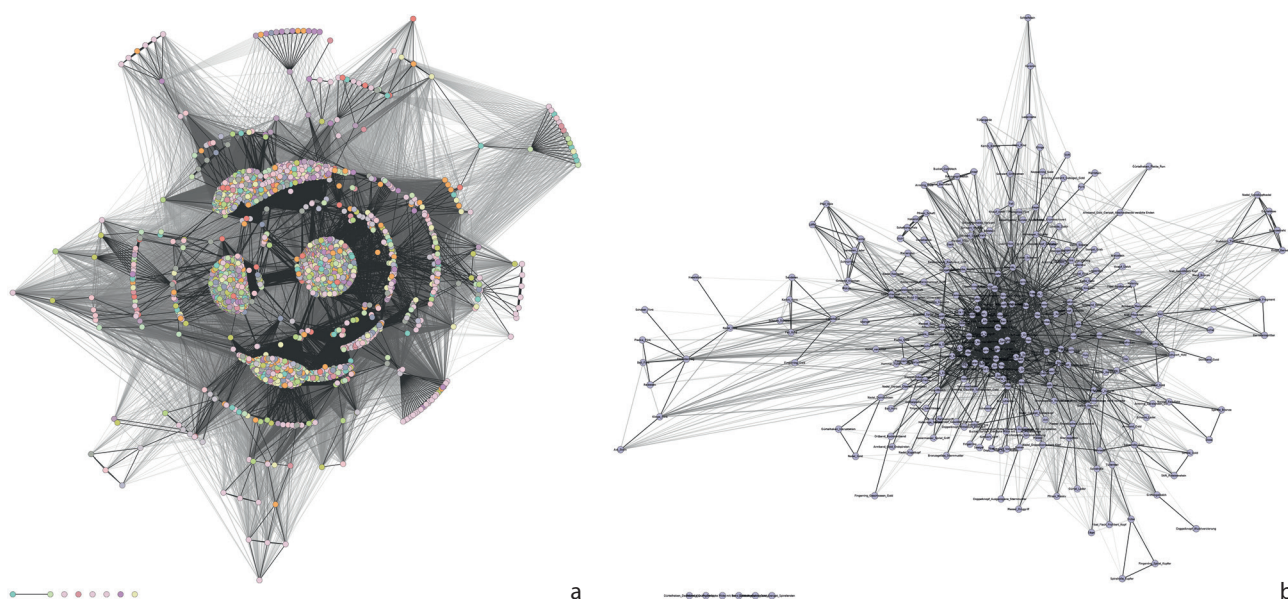


Fig. 9. One-mode networks of male graves (n = 2690): a – Grave similarity based on number of shared artefact types, node colour by ANER and Kersten volume; b – network of artefacts based on co-appearance in female graves (Graphics: authors).

Network a (Fig. 9a) demonstrates an overall homogeneous group of male burials, yet with apparent clustering in the ‘central periphery’ linked to the different sword types in the burials. The outer periphery displays some outliers; however, the male outliers are

predominantly represented by burials with few or only one artefact and therefore placed in individual ‘singular clusters’. The node colour (by regions) indicates that the clustering is not regional but that the clusters are mixed by individuals from across the Nordic Bronze

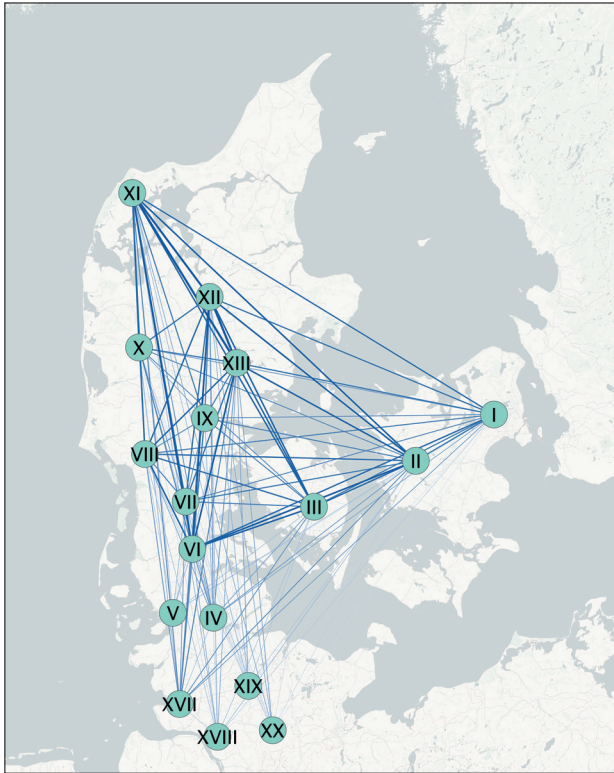


Fig. 10. One-mode networks of male graves (n=2690): Inter-connectedness of Aner and Kersten catalogues based on shared artefact types (note that the node for volume III has geographically been placed on Funen but in reality it is also comprised of areas on South Zealand and Bornholm; see Fig. 1 for geographical overview of volumes). Geographic (mercator), edge colour by weight (multiplicity); software: Visone (Graphics: authors).

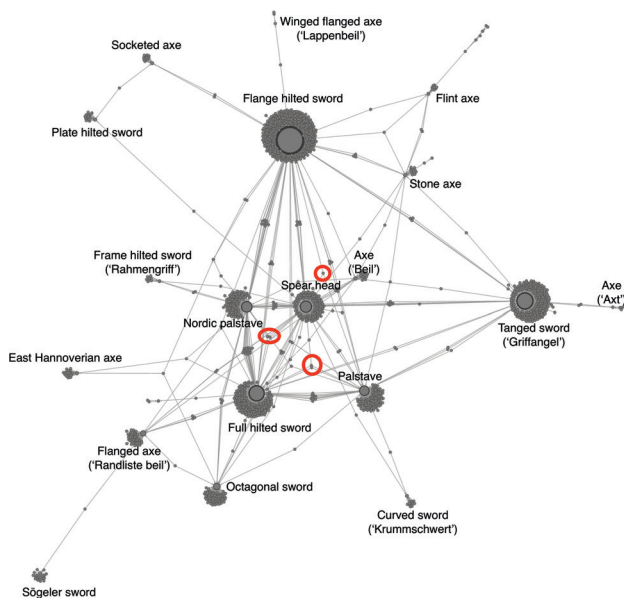


Fig. 11. Targeted network of selected burials (n=1148) with swords, axes or spears. Red circles mark the five individuals buried with the full weapon assemblage of sword, spear and axe. Layout: ForceAtlas2; software: Gephi (Graphics: authors).

Age regions. Thus, the burial clusters seem connected to social role or status instead of regional demarcation of appearance (based on object combinations).

Network b (Fig. 9b) is an object network based on the artefacts from network a. The network demonstrates a strong core representing the Nordic Bronze Age norm of often co-appearing artefacts. However, some stretching in the network with resulting outliers is observable. These outliers were found to represent Neolithic burial assemblages that have not been filtered through the data processing due to the registration practice in the indexes. The male Nordic expression is thus seen as broadly uniform yet distinguished by different sword types and weapon combinations, as observed on a regional scale by L. FELDING and colleagues (2020).

Network c (Fig. 10) demonstrates the inter-connectness between regions based on the co-appearance of artefacts found in the male graves. It is clear that we see a similar close-knit Nordic Bronze Age society as observed in the female network (Fig. 6). However, a noticeable difference is that the strong links with Northern Germany (as observed in the female network) are almost absent. Instead, the similarity of artefacts found in male burials seem regular and evenly spread over the (modern) Danish area of the Nordic Bronze Age.

Swords, axes and spears

In order to investigate the variety of identity expressions *within* the normative male gendered category of the Early Nordic Bronze Age, a selected network of targeted objects was made with the aim of investigating K. KRISTIANSEN's (1984) hypothesis, which proposed a role division of "ritual chiefs" and "warrior chiefs" based on sword types. "Warrior chiefs" are associated with flange-hilted swords and "ritual chiefs" with full-hilted swords. The targeted network (Fig. 11) is based on 1148 male burials from the dataset that included swords, axes or spears.

The network graph (Fig. 11) demonstrates the relationships between swords axes and spears in the study data. The network was made by applying a force-directed layout algorithm (ForceAtlas2) using the network software Gephi. The node size of the network is determined by degree. The principles of the layout algorithms used here have been stated above.

No distinct social identity linked to either of the sword types was observable. Both types appear in combination with other weapons, however, the full-hilted sword more commonly so. This is likely a result of the Nordic full-hilted swords more frequently being found in richly furnished graves as already observed by KRISTIANSEN (1984). It is apparent that most burials are found with either a sword,

Table 4. Male individuals buried with the full weapon assemblage of sword, spear and axe. For geographical location see Figure 2.

Full hilted sword – Palstave – Spear head	
Ke 9992 C	Volume XX
Ke 9551	Volume XIX
Full hilted sword – Nordic palstave – Spear head	
Ke 9481 B	Volume XVIII
Ke 9513	Volume XVIII
Flange hilted sword – Palstave – Spear head	
Ke 9917	Volume XX

an axe or a spear. These burials are identified as the immediate node clustering near the main weapon categories. However, several burials are found with two weapons, identified as small node clusters between the main weapon categories, and combinations of all weapon types are found (sword–axe, sword–spear, spear–axe, axe–axe). Of particular interest are five burials found with the full weapon combination of a sword, an axe and a spear (Table 4; Fig. 2). Interestingly, these burials are all from the northern German area thus offering regional insights into the expressions of masculinity in the Early Nordic Bronze Age.

UNPICKING THE MESH: GENDERED STRUCTURES IN THE NORDIC BRONZE AGE SOCIETY

Women of the Nordic Bronze Age – untold histories

The different networks presented in this paper allow for investigations of identity and regionality that are visually noticeable as clusters and outliers with a potential to inform us about the understanding of the expressions (or suppression) of Nordic Bronze Age identities. As an overall observation, the expressions of identity in the networks demonstrate an overall Nordic Bronze Age conformity with some signs of regional gendered differentiation. However, the network detail does not allow every individual expression to be recognised and therefore it is of crucial importance that these large-scale analyses are understood in relation to detailed analyses of the individual objects where stylistic traits and craft techniques are also considered (NØRGAARD 2018; RØNNE 1986).

In the following, gendered graves with non-normative Nordic grave goods will be discussed. Different burials with relevance for our understanding of the multi-faceted constitutions of gendered social roles in the Bronze Age will be presented. However, it is emphasised that these should be seen in the light of the ‘Nordic norm’ as demonstrated in the network graphs presented in this study. These individuals therefore represent strong independent gendered identities that were recognised as such in their contemporary society *because* they represented something other than the Nordic norm. A female perspective is given precedence here, as a male perspective on social roles in the Bronze Age has been explored in great detail by other scholars³.

Woman the warrior?

A total of two female burials were registered with swords in the catalogues by ANER/KERSTEN (1973–2014). These women must be emphasised as extremely powerful women in their contemporary society:

- Ke 299 Ølby, Københavns Amt: The Ølby woman was buried in a richly furnished oak coffin grave with a clear Nordic expression. She was buried with her personal belongings, including a neck collar, a belt plate with surrounding tutuli, a broken sword worn as a dagger, bronze tubes worn on a string skirt (no longer preserved), and amber and glass beads (ANER/KERSTEN 1973, 96 f.; BOYE 1896; REITER et al. 2019).

- Ke 4629A Vorgod, Ringkøbing Amt: The Vorgod woman was found as a primary burial in a mound buried with her personal belongings, consisting of a flange-hilted sword (*Griffzungenschwert*), an arm ring and a neck ring (ANER/KERSTEN 1995, 13). No human remains are preserved so it is not possible to corroborate the gendering of the grave with osteological analyses.

Several items in the Ølby woman’s grave point to the exceptional status of this woman. She is one of two women with a sword found in the dataset. Furthermore, she was buried with amber and glass beads, a powerful combination hinting to direct access to

³ BEVAN 2015; BOURGEOIS/KROON 2017; FELDING et al. 2020; HORN/KARCK 2019; HORN 2013; 2017; IVERSEN 2017; JANTZEN et al. 2011; KAUL 2013; KNÖPKE 2009; KRISTIANSEN

2002; 2011; 2014; KRISTIANSEN et al. 2020; KRISTIANSEN/SUCHOWSKA-DUCKE 2015; TREHERNE 1995; VANDKILDE 2020.

the import trade and alliance networks that reached over the Eurasian continent (KRISTIANSEN/LARSSON 2005; VANDKILDE 2016; VARBERG et al. 2015). The grave has recently been re-examined by S. REITER and colleagues (2019), revealing that the Ølby woman was most likely of local origin based on strontium isotope analyses of her teeth. Analyses of her metal artefacts revealed that the belt plate and sword were locally made but the isotopic compositions pointed to different sources in Europe for the raw materials (ibid.).

The two female graves were both found with a sword, yet express different identities. The clear symbolic placement of a fragmented sword in the place of a dagger in the Ølby woman's grave speaks strongly for a politically powerful presence but does not express the identity of a warrior. The Vorgod burial, however,

should in analytical terms be considered as a warrior which opens the discussion of an engendered warriorhood. These aspects have been unfolded by L. FELDING (2020) and will not be discussed in more detail here. It suffices to say that women with weapons were not an uncommon presence in Nordic Bronze Age society, but an expressed warrior identity is not commonly found in Nordic gendered female burials. Instead, the dagger is frequently represented in female graves (ibid.; KAUL/VARBERG 2017; MÜLLER-KARPE 2009; VARBERG 2014), and the relational analyses presented here strongly connect the dagger to the expression of the Nordic identity. Therefore, careful investigations into the political and social power (and not least) rights that followed this proposed leadership status are to be called for, however, such investigations are beyond the scope of this paper.

Woman the hunter?

Another insight into female social roles is offered by the unusual burial of the Bustrup woman. Ke 6283 A, Bustrup (Fig. 2; ANER/KERSTEN 2008, 286): The Bustrup burial contained a primary female grave with an unusual and rich grave assemblage. This woman was clearly of importance and of high status in her community. She was found with a typical Nordic female inventory such as a belt plate, neck ring, bronze tubes (as an indicator of string skirt) and a dagger. Furthermore, she was interred with two ceramic vessels most likely containing food and drink for the afterlife. Regarded as unusual grave goods, the woman was found with a boar tooth found near the dagger by the waist and three dog teeth that were drilled to be worn by the belt region. They were found behind the belt plate and next to the dagger. Based on her dental remains, the woman was 20–25 years of age. Skeleton preservation was otherwise poor with no diagnostic bones present (ANER/KERSTEN 2008, 286).

Dog teeth beads are extremely rare. The only other grave with dog teeth beads found in the registers is a child's grave from Mors Ke 5313 Solbjerg (Fig. 2; ANER/KERSTEN 2001, 157).

As dog teeth beads in graves are so rare in the Nordic Bronze Age culture, we turn to a wider European spatio-temporal context. Dog teeth beads are known from several Corded Ware and Bell Beaker Culture contexts in Europe (Germany, Poland, Slovakia and Czech Republic). Here, they are found as part of richly furnished female graves, but boar tusks are from male graves (KYSÉLY et al. 2019, 87; 112). The tradition continues into the following Únětice Bronze Age Culture but with a change in numbers and most likely symbolic meaning (KYSÉLY et al. 2019). In Indo-European society, the symbolic meaning of the

dog was related to women, motherhood and birth as well as the afterlife (ibid. 123). Other Greek and Italian myths relate the dog to the curing of ailments, perhaps explaining why dog teeth are found with children (ANTHONY/BROWN 2017, 146). Other Indo-European myths again relate the dog (and the consumption of dog meat) to rites of passage related to youthful warbands entering warriorhood by 'becoming a dog' through consuming it (ANTHONY/BROWN 2017). Dog teeth (and especially boar tusks) could also be related to hunting and hunting rites (KYSÉLY et al. 2019).

The varied mythological expressions of the symbolic meaning of the dog offer varied interpretations. However, the dog teeth beads found in the two Nordic Bronze Age graves are here considered to be most likely linked with hunting rites or to the passage to the otherworld. The hunting scenario seems applicable for the female grave from Bustrup that contained dog *and* boar teeth. These are hypothesised here to have been kept as some kind of amulets offering protection to the bearer. However, in continental Early Bronze Age contexts boar teeth are found to be associated with metal crafts (BÁTORA 2002, 179–228) and as women are believed to be transmitters of knowledge, including craft skills (KNIPPER et al. 2017, 5), this provides an interesting perspective to the Bustrup burial. The child grave is perhaps more likely to represent a connection of the dog tooth bead to the transition to the afterlife.

The findings of dog teeth beads in a female and a child grave from the Nordic Bronze Age support the overall indications of a connection of the dog (and dog tooth beads) with women, motherhood and birth.

Several women in the burial assemblage were found with non-normative Nordic artefacts. Such burials have historically been regarded as *Fremde Frauen* (JOCKENHÖVEL 1991). These women played a key role in the alliance formation across the Nordic Bronze Age and beyond (KRISTIANSEN/LARSSON 2005, 234 ff.). They would relocate as part of patrilocally exogamous marriage alliances, and would be archaeologically recognised by their burial assemblage of personal goods differing from the local norm of the society where they were buried (BERGERBRANT 2005; JOCKENHÖVEL 1991; ZICK 1993). This picture has now been both corroborated, yet made more complex, by the increasing number of studies involving strontium isotope analyses and aDNA from a wider European context (FREI et al. 2015; 2017; KNIPPER et al. 2017; MASSY et al. 2017; MITTNIK et al. 2019). These studies show that the expressed identity in a burial is not always equal to the geographic ‘non-local’ signature of the individuals or *vice versa*. It has also been demonstrated that the presence of one or a few non-normative grave goods does not equate the presence of geographically ‘non-local’ individuals. Rather, import goods were used as ways of expressing wealth and status (REITER/FREI 2015).

However, in this study we shall focus on the non-normative Nordic expressions as visible in the archaeological assemblage as non-local artefact types. The dataset offers insight into several graves with foreign artefact types, but only a few examples will be presented here. A more in-depth discussion of the female in migration in a Nordic context can be found in several works by S. BERGERBRANT (2007; 2012; 2005). It is clear that for the Nordic Bronze Age, we have examples of imported goods but also that these personalised items appear as part of a person’s identity which perhaps can reveal aspects of dual or multi-local identities (FELDING 2022, 58–61; KAUL et al. in prep.).

One burial will be described in more detail below as the content of the grave not only points towards international connections, but the arrangement of grave goods and the burial custom testify to an integration process of an individual that may not have originated in the society where she was laid to rest. Therefore, this grave will not necessarily stand out in the network shown in Figure 5a because of the object type combination and the presence of some ‘strong Nordic’ artefacts that ‘pull’ this type of grave away from the periphery. This information is crucial in our understanding of the *Fremde Frau* phenomena (JOCKENHÖVEL 1991), and also provides the cautionary note of carefully considering the emphasis that is put on singular non-normative exotic artefacts (in graves) when estimating geographical and cultural origin and identity.

The burial, Ke 3919B, Tobøl, Ribe Amt (Fig. 2; ANER/KERSTEN 1986, 64) is the grave of a remarkable female with exceptional status. The individual was found with a striking appearance: The burial exhibited hair rings as head ornaments, eight amber beads and one jet bead, presumed to have been worn around the neck and wrist, a belt plate made of a wheel much like the one from the sun chariot, *two* daggers, a red iron stone and a *Zargenkopf*-pin that points to connections with Silesia/Greater Poland (Poland). However, the pin is unique and perhaps it is a replica of the Silesian *Zargenkopf* types or perhaps the pin originates from the Tumulus culture where similar types are also known (THRANE 1962, 96).

The grave is in many ways unusual. Jet is extremely rare and is known to originate from Britain, France, Spain and Germany. H. THRANE (1962) interpreted the jet bead as imported from the British Isles, but as several recent studies concerning Bronze Age mobility point towards the Swabian Jura (FREI et al. 2015; KAUL et al. in prep.; KRISTIANSEN/SUCHOWSKA-DUCKE 2015), this location should perhaps be reconsidered as a possible origin for the jet bead in the Tobøl burial. The red iron stone (hematite) does not occur locally in the Nordic Bronze Age but has been sourced to regions in Germany, the Czech Republic, France and Austria. The belt plate made of a wheel speaks to the adaptation of Nordic custom, but with a unique execution. Based on the archaeological evidence, this woman is therefore likely of foreign origin but expresses an integrated Nordic identity by adapting a belt plate of unique character. The wheel from a ceremonial wagon is strongly symbolic and imbued with ritual significance.

The red iron stone found in the grave is an unusual object only known from two other graves in the study data (Fig. 2):

- Ke 9723B Jarsdorf, Kreis Rendsburg (ANER/KERSTEN 2005, 149; THRANE 1962): An ungendered grave containing a dagger, a ceramic vessel and a red iron stone.
- Ke 9799 Klein Niendorf, Kreis Segeberg (KERSTEN et al. 2011, 9): A female grave with grave goods consisting of a spiral ring, a dagger, a fibula, a belt plate, a pyrite and a red iron stone.

The red iron stone is an artefact class not widely discussed, but THRANE (1962, 111 note 61) tentatively suggested that the stones served the purpose of make-up stones relating it to findings from predynastic Egypt. Perhaps the stones could have also been used in painting ceramics. However, a more ritualistic function could also be considered in accordance with the function as make-up which – together with the use of ochre – would allow for a

striking appearance in ritual ceremonies. Possible signs of ochre were found in the female grave from Vesterlund (Fig. 2, Ke 4493 C; ANER/KERSTEN 1990, 83), and could perhaps be related to social status in life that required rituals involving ochre as a rite of passage to the afterlife. In this grave, the possible ochre was identified as a thin layer where the body was placed and not as a red-iron stone such as the ones from Tobøl, Jarsdorf and Klein Niendorf.

Men of the Nordic Bronze Age – too many chiefs?

In this paper, male social roles have been investigated through relational approaches of weapon type combinations as well as investigations of weak links in object networks.

A network based on selected weapon types – swords, axes and spears (Fig. 11) – enables an investigation of the hypothesis of K. Kristiansen (1984) and K. KRISTIANSEN and T. B. Larsson (2005) who propose a division of leadership in Nordic Bronze Age society between religious and military leaders. According to Kristiansen, ritual chiefs are recognised by the presence of Nordic full-hilted swords and warrior chiefs are recognised by the presence of flange-hilted swords. KRISTIANSEN (1984) reached this conclusion by studying use-wear traces on the different sword types and found that the flange-hilted swords were considerably more worn and re-sharpened in comparison to the full-hilted swords that were more frequently found in richly furnished graves. These observations could, however, also point to hierarchical divisions within Nordic Bronze Age society rather than vocational segregation.

Earlier studies linked social roles of men to expressions of identity, pointing towards the division of social roles in warfare associated with the weapon assemblage in the graves (FELDING et al. 2020). This study concluded that leadership was demonstrated in burials with swords, as these individuals were the only individuals who carried more than one weapon type (such as the axe and spear). The analyses further concluded that no graves were found with the full weapon assemblage, indicating a practical/social function in war rather than an expression of the accumulation of prestige goods as an indicator of wealth and status of the individual (ibid.).

The network (Fig. 11) supports a general division of social roles in relation to warfare with specialised weaponry skills as suggested by L. FELDING and colleagues (2020), but with the previously unobserved addition of individuals with the full weapon assemblage of sword, spear and axe (Table 4). This combination is only found in the northern German area in five burials and thus stands out as a potential regional male identity marker of high social status. The

The analyses presented in this paper point to distinct (normative) differentiated social networks for women and men in Nordic Bronze Age society, yet with some examples of non-normative occurrences and blurred gender categories. The few examples of untold histories of Nordic Bronze Age women allow for a more nuanced picture of female social roles in the Bronze Age that must be viewed as more diverse and powerful than hitherto emphasised.

weapon combination most certainly equates to rank, perhaps not only to military but also to social and political power – chieftain status seems to be a fitting term for such a role. If one was to hypothesise the existence of ‘warrior chiefs’, these individuals seem to have been better-suited candidates than based on sword type alone – and it is noted that both the Nordic full-hilted sword and the flange-hilted sword are present in these five burials.

The difficulty in sustaining a division between political, religious and military power has been noted by several scholars. The presence of a sword is often equated with the presence of a chieftain (KRISTIANSEN 1984). However, basing the presence of a chieftain just on a sword in a burial is too broad a definition. We would simply have too many chieftains in the Nordic Bronze Age to sustain any meaningful hierarchical society (BUNNEFELD 2014). Instead, object combinations and especially emblematic objects should be emphasised as indicators of high-ranking social and political leaders such as the *Guldhøj* and *Kivik* burials (BOYE 1896; RANDSBORG 1993). Both graves were found without a sword, but clearly demonstrate high social rank. It is however arguable that the individual from the *Kivik* burial was originally buried with a sword that could have been robbed as the grave was disturbed. The *Guldhøj* burial, however, was untouched before excavation in 1891, and with regard to weaponry, along with the other status goods, the male individual was not found with a sword but with an axe (JENSEN 1998, 129 ff.).

Perhaps, rather than a role division between warrior chiefs and ritual chiefs (KRISTIANSEN 1984; KRISTIANSEN/LARSSON 2005, 276), the swords seem to point to free and independent men of importance (BUNNEFELD 2016; 2018; 2014; KAUL 2019) most likely structured in kinship-based systems (BUNNEFELD 2014; WILLROTH 1999) and with specialised functions (including rank) in conflict and warfare. These observations fit well with Kristiansen’s own definition of a Nordic Bronze Age society characterised by ‘decentralised complexity’ (KRISTIANSEN 2007).

The multi-faceted nature of female political and social power in prehistory has been underlined by the recent publication by V. LULL and colleagues (2021) who demonstrated how emblematic objects can be directly linked to women as in the case of the extremely rich double grave 38 at La Almoloya in southeast Iberia from the late El Argar phase (ca. 2200–1550 BCE). They describe crowns and diadems as easily recognised emblems of power that transform the wearer into a hybrid entity – ‘an emblematic subject’ – and based on rich female graves, some with emblematic objects, the question is posed “whether a class-based state society could be ruled by women?” (ibid. 20). The Iberian case is without doubt an exceptional example, but it does raise the question if such emblems of power are recognisable in the archaeological record in Central and Northern Europe in the mid second millennium BCE. For that, we turn to one specific group of burials with non-normative grave goods: graves found with diadems (*Stirnband*). These objects are very rare and quite clearly not of Nordic origin. These burials will be discussed below, not only as indicators of *Fremde Frauen* but perhaps rather as individuals wearing emblems of power. We will also raise the question what the male complement of an emblematic object in the Nordic Bronze Age societies could have been.

Diadems

The diadem is known from several European Bronze Age contexts and is often found as part of the female attire.

From the Early Bronze Age burial ground at Franzhausen I, Austria, we know of 25 graves found with diadems of the total 716 graves dated to the Early Bronze Age (BzA1–BzA2) at the site (NEUGEBAUER/NEUGEBAUER 1997). The majority of the diadems were found in female graves. Only one man and three ungendered individuals (two adults and one juvenile) were identified; the remaining graves were all female containing women 16–60 years of age. Another European EBA female grave from the Lech Valley, South Germany was also identified with a diadem (KNIPPER et al. 2017, 10087). From the European Middle Bronze Age (BzB–D) several diadems are known from the Carpathian Basin. G. SCHUMACHER-MATTHÄUS (1985, Karte 21) presents ten examples of depositions and graves found with a diadem. S. BERGERBRANT (2007, 112) references known examples of diadems in Central Europe in Alburger Hochweg, Straubing, Bavaria (HUNDT 1958, 28f. Taf. 15), and notes that diadems can occasionally be found within the Lüneberg culture (LAUX 1971, 39; PIESKER 1958, Taf. 66). Examples from Northern Germany are

also known, such as the hoard finds from Kronshagen, Roga and Lübtheen (SPROCKHOFF 1957; LÜTH/JÖNS 2004, 46 cat.-no. 30; SCHWEEN 2004). The diadem from Roga carries illustrations of humans dancing in a row and it therefore suggested that the diadem was worn as part of ritual performances (SCHWEEN 2004, 155).

Several of the German and Central European diadems are found with small fragments of cloth that indicate that the diadem has functioned in connection with some kind of veil (BERGERBRANT 2007, 60f.; SCHUMACHER-MATTHÄUS 1985, 78). No organic preservation of cloth or textile have been found in connection with the diadems found in the Nordic region, but the diadem in grave Ke 9005B (Fig. 2) is believed by E. ANER and K. KERSTEN (1991, 7 Ke 9005B) to have been situated on a hat or cape.

The diadems from Nordic contexts are taken to represent *Fremde Frauen* that most likely came to the north, perhaps as part of marriage alliances (BERGERBRANT 2007, 121; ROWLANDS 1998). If this is accepted, then a connection with German and Central European style and use would be expected. The diadem as the mark of a veiled woman is a markedly different signal than the almost regal nature of the Iberian diadem in grave 38 at La Almoloya. No comparison is otherwise intended as the geographical and chronological difference separates the two categories, it is, however, interesting to contemplate the nature of the diadem and the different emblematic meaning shifting in relation to how they were worn and presented.

A veil is known in antiquity to be a sign of respectability and high status (STOL 2016). Veiled women are recognised only in very few grave contexts in the Early Nordic Bronze Age. How are we to understand the meaning of these head garments? One explanation is that these women were an important part of the alliance networks formed between the Nordic region and the continent. The women are believed to represent the highest class of a ranked society, perhaps carefully chosen to form alliances between powerful families and thus wearing a diadem and veil according to local custom after arriving at their new home. It is thus likely that the veil would be an important part of the appearance of such high-status females.

Interestingly, one diadem from the Nordic area (Table 3) was found in a male grave – that from Erdrup (Fig. 2; ANER/KERSTEN 1976, 143 Ke 1130). Otherwise, the diadem must be considered as predominantly associated with the female expression. The crucial difference between the diadem in the Erdrup burial (Ke 1130) and the female examples from Nordic contexts is that the male example was made of gold and the female examples were made of bronze. The Erdrup burial is also earlier (NBA I) than the dated examples from the female burials that all fall within NBA II.

Folding chairs

If it is accepted that the diadem reflects the emblematic powerful status that could be obtained by women, what is then the male equivalent artefact of such emblematic nature? One such artefact predominantly found in male graves is the folding chair (Fig. 12) and, in the following, this will be considered as the male emblematic expression of power and status in Nordic Bronze Age society.

The folding chairs found in Nordic contexts are unique for the Nordic Bronze Age culture, locally made but modelled after foreign examples known from Mesopotamia and Egypt. One such contemporary example can be found in Tut-Ankh-Amon's grave (CARTER/MACE 1923, 219 plate 74). The Egyptian pharaoh is an example of the highest position in society, combining political, military and religious power (GÖRG 2001; HORNUNG 2005; KAUL 2019). The knowledge of the chair spread from the eastern Mediterranean and became an exclusive prestige object in the north, and who ever commissioned and made the folding chair in the Guldhøj mound (Fig. 2, Ke 3820 A; ANER/KERSTEN 1986, 29) must have seen original chairs from the far away cultures in the Near East and Greece.

A total of 20 folding chairs are known from the Nordic Bronze Age (FABIAN 2009; KAUL 2017; PRANGSGAARD et al. 1999). The folding chairs are all found in male gendered graves from the NBA II (ca.



Fig. 12. Folding chair from 'Guldhøj', Denmark (Photo: R. Fortuna/K. Ursem, National Museum Denmark; licence: CC-BY-SA).

1500–1300 BCE), and regarded as symbols of the highest political power (KRISTIANSEN/LARSSON 2005, 303–305). Perhaps, in order to examine chiefly status in Nordic Bronze Age society, focus should be placed on items such as the folding chair – as a symbol that combines political, military and ritual power – rather than weapons alone. Their rare occurrence points towards leaders that were part of complex and far-stretching networks within and beyond the Early Nordic Bronze Age (BUNNEFELD 2014; KRISTIANSEN 2007).

CONCLUSION: LEADERSHIP DUALITIES? POWERFUL WOMEN AND MEN OF THE NORTH

The burial record reveals no clear hierarchical distinction between male and female burial customs or grave constructions in the Nordic Bronze Age. Rather, we see gender equality in death as already observed by L. FELDING (2020; 2022). Both gender categories are interred with the same burial custom and are found in equal numbers (%) as primary burials marked by monumental mounds (FELDING 2020, 6). The notably higher number of male burials in the archaeological record is therefore argued here to be the result of a taphonomic and research tradition bias and not a reflection of the real number of (high status) female burials in Bronze Age society. To evaluate status and

social roles, each gender category should be assessed separately as they cannot be compared like to like, as the mark of status and rank would be expressed differently.

Based on the archaeological assemblage from a Nordic context, it would seem to be an exclusively male privilege to sit on a folding chair. However, this privilege should perhaps be understood in relation to the exclusive diadems predominantly found in female graves thus potentially representing a duality in leadership structure in Bronze Age society represented by men *and* women with separate, yet intersecting spheres of interaction and socio-political influence.

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SUPPLEMENTARY INFORMATION

Suppl. 1. Study data of 5 169 burials from the published Aner and Kersten catalogues (1973–2014).

Suppl. 2. Object type categories used in the analyses.

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