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„Identities in a Period of Transition: Theory and Statistical Modelling Case Studies at the Early Iron Age Cemeteries of Oberndorf in der Ebene, Ossarn and Inzersdorf ob der Traisen."

verfasst von / submitted by

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Preface

The initial impetus for this research came from a personal desire to investigate deeper levels of past and present social and individual complexity. In an archaeological context, any attempt in this direction will help us overcome stubborn, imprecise generalisations about past cultures and consequently understand them in a more coherent way. In the present context, any such forays into deciphering past social complexity can do their part to alleviate society's anxiety about the ever-increasing complexity of the modern world.

This thesis' dual emphasis on group identities serves as the best example of this. My interest in social identities stems from more than just a fundamental fondness for social archaeology, archaeological theory, or sociology and psychology. It is also based on the paradox that most people are aware of the intricacies of identities while simultaneously remaining frustratingly ignorant of them. Though by no means a modern phenomenon, particularly in the age of identity politics, people will gather around one very specific aspect of their identity, be it their religion, gender, or social class. In the course of this fixation on merely one category of identity, often all other parts of their own or the participating groups multilayered identities are deliberately or subconsciously forgotten or ignored.

For instance, during most contemporary political discourses on migration issues, the primary polemic platitudes gather on either side of the extreme spectrums. Therein, all members of any such group are generalised as "good" or "bad" based purely on that specific ethnic identity. Disregarding entirely that a 19-year-old uneducated, overly religious, destitute male individual of such a group is absurdly distinct from a 45-year-old female, agnostic, child dentist of that same group. The issue is that, regardless of the intention, any generalisations never help overcome preconceptions against any prejudiced group. Not only that, but any attempt to reduce a person to a single label will fail to capture who they really are. Controversially, I would also argue that this assertion applies to self-definitions.

This is something I can personally relate to. Since I am half Persian and half Austrian, over my life I have been constantly reduced to, or at least labelled as, either of these ethnic tags. Ironically, other than sports and culinary matters, both ethnicities are not significant to my personal identity. As much as for me, the aforesaid migrants, Iron Age communities, or any group of people, all generalisations feel unjust and irrational. I would argue that in reality, even all of the combined base group identity categories of gender, age, ethnicity, religion, and class are not sufficient to truly understand a person or the society they belong to. Therein lies another major motivation for this thesis: to find a way to portray the complex and interdependent web of individual and social identities that form a community.

Of course, in academia, the awareness of the intersectionality of identities is far more established than in public discourse. Yet, to this day in Iron Age archaeology, we often overfocus on past cultures ethnic identities. The argument is not that any such discourse has its own merits in correcting past misconceptions. Rather, by overfocusing on one or two fresh terminological pigeonholes, the debate still discounts that even two labels such as ethnicity or gender are essentially inadequate to define all those Iron Age men and women of various age groups, occupations, social classes, and likely religious beliefs.

As an archaeologist, the desire to research complexity and identities is a double-edged sword. For one, the data we study is in almost all cases naturally fragmented and consequently seems insufficient for any foray into complex social micro- and macro-dynamics. On the other hand, since archaeology is particularly interdependent with neighbouring scientific fields, for the most part, students are encouraged to delve into and partake in interdisciplinary research. I wholeheartedly agree with the need for interdisciplinarity. I would even go so far as to say that any aspect of human complexity can only be grasped by incorporating as many relevant scientific fields as possible. The holistic approach and, admittedly, ambitious scope of this thesis should be explained by this statement.

For a long time, this task lacked a methodology and tool set that were suitable to grasp the intricacy of group identities. Particularly, any such method needed to be applicable to archaeological data and allowed to negate any intentional and unintentional scientific biases as much as feasible. At that point, a professor of mine gave me the book "Modelling Identities" by Cătălin Nicolae Popa. His combination of quantitative archaeology, social theory, and burial data, consequently, became the model study for this master's thesis. Such quantitative methodologies are still not a representation of reality, such a thing is impossible. However, they allow for computation and clustering of complexity outside of extreme positions and come with a digital working apparatus to portray and interpret them in an understandable and plausible way.

This is the ideal time to thank various people for their help. First and foremost, Simon Braito, who not only programmed the data base and adjusted Popa’s similarity algorithm for my needs but also opened the door to the world of data science and programming and pushed me forward during our recurring therapeutic working and planning sessions. My supervisor, Peter Ramsl, for his support throughout this complicated and lengthy ordeal with honesty and perseverance. My better half, Katharina Heiß for being my primary motivator, proofreader, and generally for being the best person I know. Cătălin Popa, for being my inspiration with his great preceding work. Finally, I want to thank all of my remaining proofreaders and friends, Daria Grigoryeva, Ken Reitermayer, Terry Lee, Valentina Laaha and Florian Kindlinger, who all particularly endured the early stages of this thesis.

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List of Abbreviations:

approx.	=	approximately
BC	=	before Christ
cf.	=	Lat. *confer/conferatur*, Eng. ‘compare’
cm	=	centimetres
ed.	=	Edition
Ed/Eds.	=	Editor/Editors
e.g.	=	Lat. *exempli gratia*, Eng. ‘for example’
Eng.	=	English
etc.	=	Lat. et cetera, Eng. ‘and other similar things’
et al.	=	Lat. *et alii*, Eng. ‘and others‘
fn.	=	footnote
HA	=	Hallstatt Period
ha	=	hectares
i.a.	=	Lat. *inter alia*, Eng. ‘among others’
i.e.	=	Lat. *id est*, Eng. ‘that is’/’that are’
INZ/-	=	Inzersdorf/ a specific grave number
Lat.	=	Latin
LT	=	La Tène Period
m	=	metres
m^2	=	square metres
OBD/-/-	=	Oberndorf/ a specific grave number and /excavation date
OSS/-/-	=	Ossarn/ a specific grave number and /excavation date
p./pp.	=	Page/Pages

1 Introduction

1.1 Case Studies at Three Early Iron Age Cemetery Sites in Lower Austria

This thesis is divided into two distinct but complementary parts. First, an in-depth analysis of 'identity theory' and group identities, as well as their representations in funerary rites and material culture in general. Second, four case studies, which, by means of statistical modelling via hierarchical cluster analysis, aim to visualise potential group identities at the neighbouring Iron Age cemeteries of Oberndorf in der Ebene ('Oberndorf' from now on), Ossarn, and Inzersdorf ob der Traisen ('Inzersdorf' from now on). The data is based on respectively, 40 usable graves, consisting of 47 burials in Oberndorf, 21 usable graves, consisting of 27 burials in Ossarn and 12 usable graves, consisting of 13 burials in Inzersdorf.

Along with similar settlements and cemeteries in the Traisen Valley as Pottenbrunn or Franzhausen, all three cemeteries existed contemporaneously and in close proximity, within a range of approx. 1 to 6 kilometres. The chronological limitations are set to the period of transition between Hallstatt D and La Tène B. In the same timeframe, when the group commonly described as 'Celts' emerged and established itself in written history. The main objective of the case studies is to evaluate the usability of statistical modelling of funerary data via cluster analysis, which in this case is based on three single, not fully excavated cemeteries, with a limited but high-resolution set of data. While three separate clustering procedures are conducted on each of the cemeteries individually, a fourth cumulative procedure comprised of all three cemetery sets of data is generated to validate and compare the potential group identity clusters. This is complemented with a well-founded set of contextual frameworks to establish a plausible interpretation of the final results.

Previous studies by i.a. Barbara Hausmair (2015), and particularly, 'Modelling Identities' by Cătălin Nicolae Popa (2018) are the main inspiration for combining theory and modelling techniques. In particular, Popa's work combined 'identity theory' and cluster procedures, to visualise pre- and protohistoric group identities based on burial contexts. Aside from combining theory, method, and data, these studies also inspired the application of a specifically created database, to record both burial rites and grave goods. The items are organised further in a four-tiered category hierarchy (Nakoinz, 2012), in order to explain them both functionally and typologically. Based on in that manner structured burial data, a similarity algorithm originally devised by Popa (2018, 59-66), calculates a value that defines the degree to which each grave is similar or dissimilar to every other potential grave. The clustering procedure occurs twice, once for funeral rites and again for burial goods information, which is then provided to the operator as a whole.

Based on parallels and variations in burial rite and grave construction, total number of artefacts, number of decorated and bronze objects, and repeating combinations of object functionality and typologies, the procedure yielded six to eight groupings. To ensure a plausible interpretation, these groups and subgroups are analysed in three separate ways. First, by statistically cross-analysing them with non-quantifiable and over determinative components of identity, such as anatomical age and sex. Second, by comparing the clusters with their actual established archaeological contexts. Finally, by a GIS-based spatial analysis. The final cluster groups are predominantly based on the cumulative clustering and suggest a flat social hierarchy, consisting of traditional but notably flexible and intersecting early Iron Age group identities.

Many aspects of the chosen analysis method require an advanced understanding of statistical methodology and database management, as well as the creation of a digital working apparatus. For this reason, this thesis was produced as a partial collaboration with my colleague Simon Braito, a computer science graduate student at the TU Graz. His contribution was programming the database in R from the ground up, creating a personalised interface, implementing all necessary statistical packages, and adapting Popa's similarity algorithm. In addition, we attempted to improve the combination of the existing digital toolkit. While previous studies (Hausmair, 2015; Popa, 2018) used a combination of programs, such as R, MS Access and ArcGIS, we sought to collect all methodological requirements in R. This is why a database and interface were specifically programmed for the purposes of this thesis. Not only does it include the majority of methodological aspects, but it is also intended to be a user-friendly, free-to-use method of applying this method in future endeavours for anyone who is interested in using this or similar variations of statistical modelling. The implementation of the clustering based on the similarity algorithm contributed specifically by my colleague will be touched upon in an in-depth description as an appendix.

1.2 Theory and Statistical Modelling

Over the last five decades, archaeological research on identity has evolved considerably. Aspects of individual and group identities that were neglected prior to the 1970s, such as age or gender identity, have since come into scientific focus and remain so to this day. In contrast, research on group identity in its complex entirety is rarely conducted far beyond a theoretical perspective (Díaz-Andreu, Lucy, Babić, et al., 2005; Fernández-Götz, 2014; Rebay-Salisbury, 2016a). Such research is not an easy task, as it involves a number of critical theoretical and practical issues, especially when conducting research on prehistoric group identities.

First, there is the inherent complexity of identity. Individual identity in itself is already intricate, as it can only be entirely understood by contextualising all of its intersecting elements, which are gender, age, ethnicity, class, religion, and various sub-identities such as occupation (Díaz-Andreu, Lucy, Babić,

et al., 2005; Fernández-Götz, 2014, 13-14). This complexity increases significantly with research on group identities. The perceived group identity of any community exists in a constant feedback loop between its members' individual identities and interdependencies from their environmental and social spheres.

Second, identity is never constant. While group identities may appear to be stable for generations in some cases, a variety of impact events, such as drastic technological or climate changes, war, or years of prosperity, can lead to severe shifts in group identity perception. For prehistoric societies, any such impact events are additionally intangible. They are themselves pieces of a reciprocal knock-on effect of social and environmental events. Their effects diffuse unevenly from supra-regional to local communities to varying degrees (Draems, 2021, 107-116). As a result, searching for direct causalities is often like looking for the 'chicken or the egg' 'in a haystack'. However, when confronted with periods of change such as the titular period of transition, regardless of any direct causalities, patterns of changing group identities become more likely to be observable.

Quantitative methods, such as clustering analysis, are a tool to uncover and visualise these complex patterns derived from ideally established archaeological contexts. A considerable number of burial contexts are the most frequent and dependable data source for such research. Notwithstanding that these rites and material manifestations are filtered through the perceived communal social norm and lack a significant number of immaterial aspects of identity, any researcher faces considerable amounts of overlapping data that must be analysed. By manifesting features of their intersecting identities within their material cultures, past societies enacted their multilayered and overlapping common self-perceptions through praxis. As a result, these manifestations of identities emerge as recurrent patterns. While this renders such data excellent for cluster analysis, the fundamental advantage and downside of these methodologies is that any interpretation of the resulting clusters remains entirely empirical. As a result, an archaeological and holistic theoretical framework is still quintessential (Popa, 2018, 52-55).

Finally, quantitative approaches employ a variety of scientific and data science validation practices for exploring group identities by processing archaeological data with quantitative methodologies. Serving as a tool for reducing research bias and subjectiveness in context of prehistoric identities, which is an inherently subjective and complex, but also often political and personal matter (Niaghi, in press).

1.3 Structure of Thesis

Before elaborating on the structure of this thesis, a quick outline of certain text formatting aspects seems appropriate at this point. Generally, with the exception of toponyms or names, all non-English words or terms are written *in italics*, as with Latin phrases like *Galii* or German words like *Identität*. Only direct citations are put in "double quotation marks". 'Single quotation marks' are used if a

statement references the terminology of a specific 'word', if a 'term' is highlighted, for 'unscientific' or 'colloquial expressions', as well as 'book titles', '*termini technici'*, and 'theories'. The latter was decided to avoid confusion, which resulted from the introduction of a large number of archaeological and non-archaeological theoretical concepts. The exceptions to these formatting conventions are Chapters 9.5 and 11. This is because defining the database structure and tables required its own text formatting rules, which will be detailed at the start of each of the two chapters. Typological terminologies are either translated if a respective term is describing, such as 'carving knifes', or left in the original language if a term is considered a proper noun, like '*Fußzierfibel*' (Fibula with Decorated End), along with a rudimentary translation in brackets the first time any such term is used. If a term is named after a specific location, such as fibula type '*Certosa'*, these remain untranslated and written in *italic*, despite being named after toponyms.

The structure of this thesis is also partly inspired by Cătălin Popas work 'Modelling Identities' (2018). This is particularly true for the way some theoretical considerations are integrated within other essential methodological and contextual aspects. Traditionally, theoretical considerations are collected in a specific chapter. Although this is partially true for Chapter 6, similar to Popa's (2018, 8-9) study, many further theoretical matters are deliberately placed in proximity to those chapters they actually deal with. This not only highlights the symbiotic character of theory, method, and data but also essentially helps the reader better comprehend the correlation, warranty, and impact these theoretical conceptualizations have.

To return to the structure, the methodological section consists of two separate segments for structural reasoning. This was done since the two basic methodological aspects of the thesis, holistic theory, and quantitative modelling, are in many ways fundamentally distinct, and it seemed appropriate to separate these two chapters. The first being the following chapter 4, which encompasses a basic introduction of the holistic working apparatus as well as why and how the holistic fundament was researched (4.1). This is followed by a debate on the relativity and the inherent bias-generating properties of identity (4.2.1 – 4.2.3) and how a holistic approach and even more so quantitative methodologies can reduce research bias and portray complexity in a comprehensible way (4.2.4). The first methodology chapter is then closed by an excurse on methods and various approaches that were not available for the thesis but would augment any future attempt (4.3). The second methodological chapter will focus entirely on the quantitative aspects of this thesis and will follow in chapter 10 just before the quantitative results are presented.

Chapter 5 covers the collected archaeological and theoretical research histories for this thesis. The first subchapter comprises the required description of East Austrian and Traisen Valley archaeological research histories (5.1). The subsequent section (5.2) serves as a basic introduction to the concept of

‘identity' itself, how it is used for this thesis, and its generally complex and ambiguous status (5.2.1). As part of this thesis’ holistic concept, these ambiguities and intricacies are not only addressed by considerations within archaeology (5.2.2), but additionally by those of other scientific fields, such as psychology (5.2.3.1), sociology (5.2.3.2) and ethnology (5.2.3.3).

This is followed by the only solely theoretical chapter 6, which introduces the concept of group identities, how they intersect and form a ‘hybrid identity’, as well as a comprehensive portrayal of all group identity categories (6.1.1 – 6.1.6). This theoretical chapter is an overview followed by an in-depth debate on the perceived duality of individual agency and structure (6.2), how our present perspective of identity can affect interpretations of past identities (6.2.1) and lastly, if individuality can be expected in an Early Iron Age context such as the Traisen Valley and its consequent implication for the clustering procedure (6.2.2).

Chapter 7, ‘Framework’, aims to bring together the most essential contextual aspects in which the processed data, i.e., the buried individuals, existed. The first two subchapters consist of the established chronological framework (7.1). This is followed by a summary of the spatial and social context (7.2). The latter are comprised of three contextually relevant excerpts. First, a brief description of the only definitively related settlement for one of the three studied cemeteries, the village of Inzersdorf – Walpersdorf (7.2.1.1). Secondly, a brief look at the western (7.2.2.1) and eastern (7.2.2.2) Late Hallstatt social macro-levels, which ultimately allow partial deductions to be made about the potential social structure of the area under study.

Since burials are the primary archaeological data utilised by the similarity algorithm to create the clusters, chapter 8 remains one of the most significant chapters. It introduces all pertinent theoretical concepts relating to how identity can be expressed within material culture and consequently manifest within burial contexts. These mostly theoretical issues cover how the identity of any deceased person as perceived by their community finally manifests in their burial ritual (8.1), a brief overview of those rituals relevant to the context being researched (8.2), as well as three excursions on Pierre Bourdieu’s (1977b) ‘theory of practice’ and ‘habitus’ (8.3), on the ambivalent concept of ‘identity marker’ (8.4) and finally grave robbings and openings (8.5).

Chapter 9 can be seen as the actual start of the quantitative part of the work. It covers all facets concerned with the data utilised for the clustering procedure and the database itself. The first two chapters (9.1 – 9.2) deal with general data quality and its issues. Following this is a description (9.3) of how all entered data is structured within the database specifically developed for this thesis. This is complemented by a detailed account of the table description (9.3.1), of all three hierarchical levels. Section 9.4 is a precursor to the subsequent second methodology chapter, as it describes the ‘object categorization', which is not only the way the ‘objects table’ is in itself hierarchically organised but also

one of the two primary aspects the clustering procedure is based on. The closing sub-section, 9.5, briefly displays the data used for this thesis along with specific precedents and general trends, each from Oberndorf (9.5.1), Ossarn (9.5.2), and Inzersdorf (9.5.3).

Chapter 10 is the second methodological chapter and discusses all quantitative aspects applied to this thesis. We start with an introduction to the clustering procedure (10.1), how it works, how it was applied for the four case studies, and which different clustering methods were used in parallel for validation purposes. Following this is a description and formulation of the 'similarity algorithm' (10.2). This section discusses for what reasons it was initially established by Cătălin Popa (2018, 59-66) and how it was devised for this thesis specifically. This chapter is supported by a brief presentation of the psychological concept of 'in-group bias' (10.2.1), which can be considered the theoretical basis of the similarity algorithm. Following this, is Subchapter 10.2.2, which presents the 'weight calibration process' as well as its function and justification. Subchapter 10.3 addresses the question of how additional statistical analyses were implemented in the database and to what extent they complement the obtained cluster. Subchapter 10.4 finally portrays how the spatial analysis and visual presentation were achieved via GIS.

All the following chapters are part of the actual 'results'. These are divided into 5 larger sections. Chapter 11 describes the purely statistical results of the collected cluster procedures, supported by a detailed description of how and with which parameter they were obtained. Chapter 12 is the actual interpretation of the obtained 8 clusters and sub-cluster groups. This is followed by the complementary GIS-based spatial analysis in Chapter 13. Finally, the penultimate Chapter 14 is the final discussion of the results, which attempts to capture the social structure, power structures and inherent intersecting group identities with the help of all the previously holistically established concepts. Chapter 15 formally closes this thesis in the form of a conclusion and German summary.

In addition to the bibliography and annex, there is an appendix written by Simon Braito with a more detailed breakdown and formulation of the similarity algorithm used for this thesis.

2 Methodology 1: Establishing a Holistic Fundament

This first methodological chapter discusses why the author chose to explore a sizeable number of scientific theories and models outside of his archaeological comfort zone. In archaeology, this holistic approach has its roots in 'Processualism' and flourished in a Hegelian and Marxist manner within 'Post Processual Archaeology'. In recent years, the intention has been to transcend theoretical trenches and combine ideas of 'Processualism', 'Cultural History' or 'Post Processualism' (Hodder and Hutson, 2003; Renfrew and Bahn, 2004; Trigger, 2006, 397, 446). One essential takeaway is that there is no general right or wrong in theoretical schools of thought. Labels as 'Processual' or 'Post Processual Archaeology'

are necessary tools, as are debates like the famous Binford vs Hodder argument (Trigger, 2006, 580). However, all scientific schools of thought, archaeological or within the humanities in general, have at least some aspects that are still useful. If only to provoke a critical engagement with outdated ideas or one's own preconceptions.

A representation of what a holistic mode of operation should be is 'total archaeology'. Coined as such by Christopher Taylor (1974), specifically in context of landscape archaeology, Taylor believed that, when doing an archaeological survey, to achieve a complete diachronic understanding of a landscape all possible sources must be utilized. These include archaeological excavations, historical sources, or records, and, when used critically, even aspects, such as folklore or toponymy. This pluralistic approach should not be limited to landscape archaeology, but, if possible, to most archaeological projects. It can be applied for theoretical considerations, but also for interdisciplinary methodological aspects and data gathering.

This overall holistic methodology as further described in works of i.a. Kristiansen (1998), Hodder and Hutson (2003), Kristiansen and Larsson (2005), Renfrew and Bahn (2004) or Fernández-Götz (2014), recognizes that archaeology is part of the larger pigeonhole of human and social sciences, which also greatly benefits if combined with natural sciences or quantitative methods. Even more than in one's own field, this requires a constant awareness of methodological limitations as well as a critical analysis of each source's credibility and how applicable it is for answering the questions being asked. Thus, it should be kept in mind that this procedure is never about direct comparisons or universal rules, but rather an acceptance that within the complexity that are human societies, analogies provide possibilities and reflections, that, if done correctly, are necessary for in depth interpretations (cf. Fernández-Götz, 2014, 3-4). A verifiable truth is simply not achievable in our discipline. In some cases even with contributions of the natural sciences (Lindley, 2007; Fernández-Götz, 2014, 4). Rather a percentage approximation of past realities, interpretated with the highest attainable degree of plausibility.

2.1 Four Interdependent Pillars: Theory, Data, Context, and Method

This holistic mode of operation is best illustrated by the four emblematic pillars that reside on a holistic fundament (Fig. 1). These pillars, with the addition of 'context' as its own cornerstone, are based on the symbiotic correlating triangle of data, theory and method visualised by Cătălin Popa (2018, 51-52) While it can be argued that context is simply one property of data, burial data presented without any contextual information, would be a context free accumulation of bones, ashes, and various objects.

Both visualisations describe the underlying interdependencies of all practical and theoretical tools. For instance, the application of cluster analysis and a similarity algorithm, is as much based on specific characteristics of the obtained burial data, like its resolution and quality, as it is based on aspects of

'Social Identity Theory', specifically 'In- and Out Group Bias', formulated by the social psychologists Henri Tajfel and John Turner (i.a. 1979). Similarly, specific mechanism of the algorithm and Pierre Bourdieu's concepts of 'habitus' and 'Theory of Practice' (1977b), led to the choice of the hierarchically organized object categorization, a specifically designed four-tiered data organisation model (Nakoinz, 2012; Popa, 2018). Lastly, the innate fragmentary state of burial data and the particular quality of cluster analysis to intentionally produce groupings independently of pre-existing classification systems demanded further contextual knowledge to achieve a plausible final interpretation. The most essential tool to achieve this is a crucial knowledge of the essential archaeological framework.

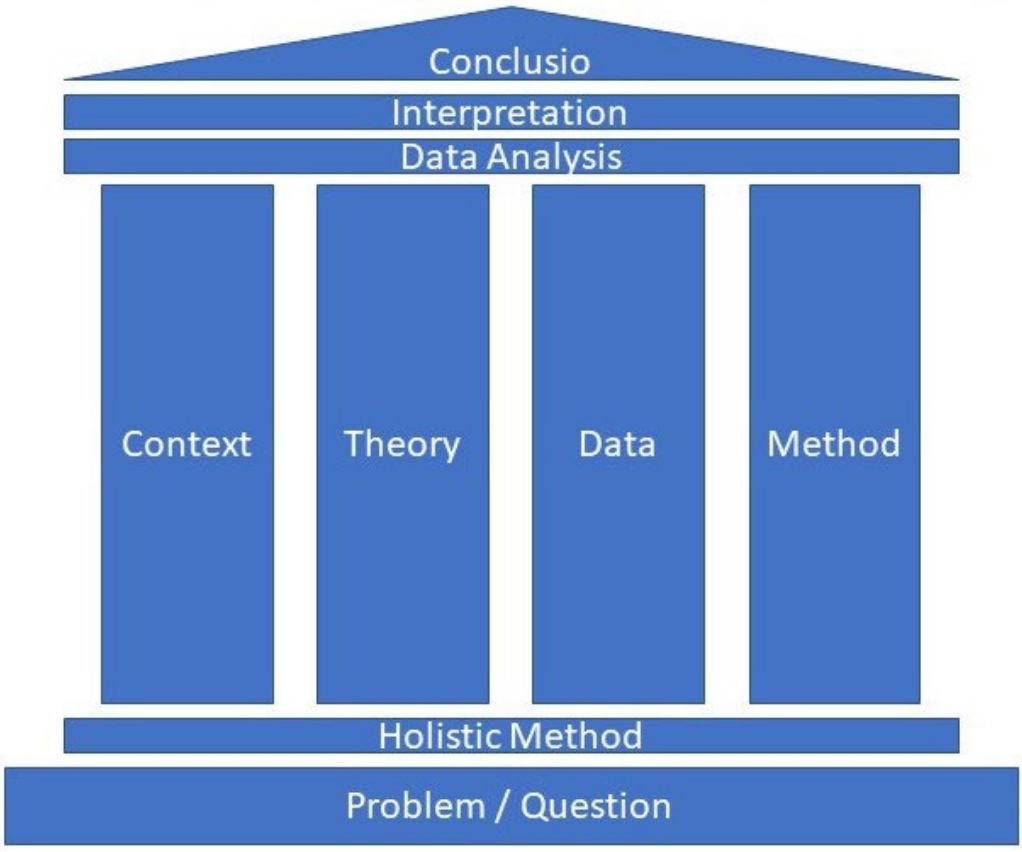


Fig. 1: the four emblematic pillars that reside on a holistic fundament. The concept is based on Popa's Feedback loob (2018, 52).

An archaeological understanding of a number of clustered burial contexts on its own, however, does not carry sufficient information to derive their place and representation within that groups perceived group identities. To achieve this, two fundamental theoretical concepts were additionally introduced. First, the concept of 'Intersectionality' (Crenshaw, 1989; Davis, 2008; Hill Collins and Bilge, 2016), which defines individual identities as a sum of all accessible group identities(Díaz-Andreu, Lucy, Babić, et al., 2005; Rebay-Salisbury, 2016a, 14-21). Second, aspects of 'Complex System Theory' (Dunbar, 1993; Draems, 2021) that establishes that each individual and group identity should be understood as

a complex system within several interdependent complex systems, such as their environment and social context, affected by various constant interdependencies.

These examples are just those most essential to highlight the constant interdependency of data, context, theory, and method from the onset to the final interpretation (Fig. 2). The holistic modus operandi is further supported throughout this thesis by other theoretical concerns, such as the consideration of individuality and structuralism (cf. chapter 6.2; also i.a.: Wagner, 1999; Gardner, 2008), or group identity and death (cf. chapter 8; also i.a.: Pearson, 1982; Sørensen and Rebay, 2007). By combining all attained theoretical observations, together with other essential sources and contextual framework, the examination of overlapping patterns within the clusters can be properly attempted, visualized, and interpreted.

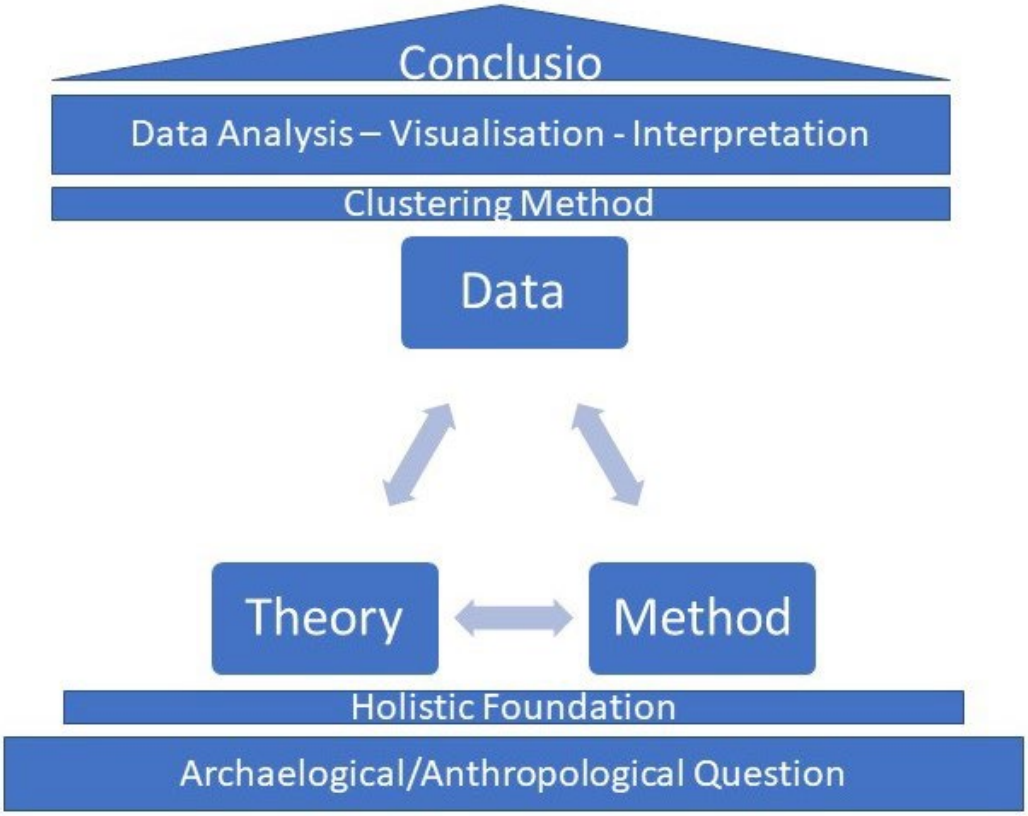


Fig. 2: Complex variation, merging the four pillars, and Popa's Feedback (2018, 52) loop as a means to portray this thesis methodological approach.

2.2 The Inherent Subjectivity of Identity and How to Reduce it

One of the primary reasons for the holistic approach lies within the above-stated complexity and innate political and subjective qualities that arise when researching identity. For this reason, this section will focus on the following issues:

1. That identity should be seen as a relative and complex system, inadequate for solely heuristic, dichotomous explanation attempts.
2. That any research on group and individual identity is particularly prone to actively or passively induced ideological research bias [1] and multiple layers of subjective research interference.
3. How any such interference can be drastically reduced and regulated by implementing quantitative methods and a sizable number of accompanying scientific and data science validation tools.

2.2.1 Identity: A Relative Complex System

In short, it is the fundamental principle of cause and effect that is the source of any identities' complexity. Almost every individual and group's identity exist within a variety of social and natural networks and interrelationships, thus becoming an element of the complex system theory's feedback loop (Rebay-Salisbury, 2016a, 23-33; Nakoinz, 2017; Draems, 2021). Identities are continuously transformed as a result of constant social and environmental interdependence. These ongoing responses do not emerge in a dichotomous way, but rather within a large spectrum of viable possibilities that serve as catalysts for future complexity trajectories (fig. 3).

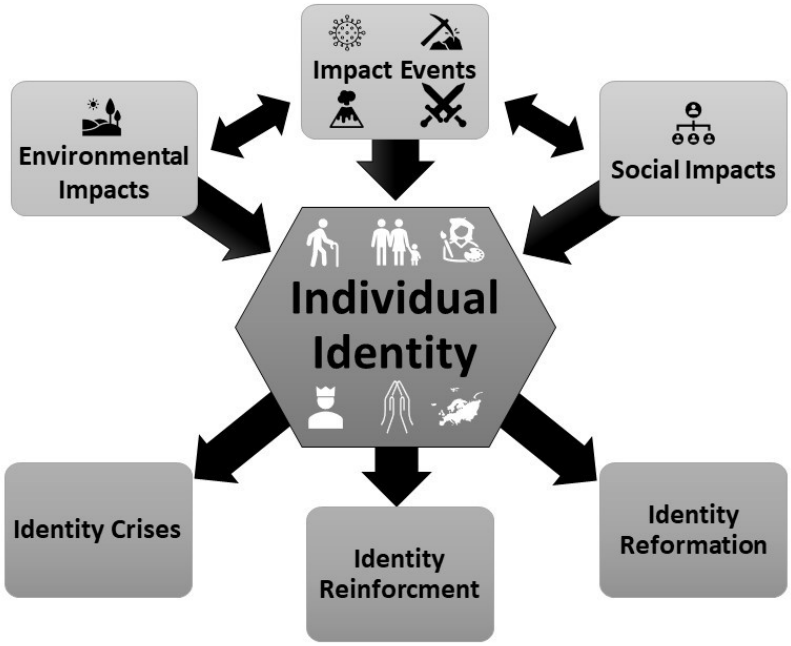


Fig. 3: A symbolic representation of the influence of external interdependencies on individual identity as a catalyst for identity transformations.

[1] 'Bias' as used in this paragraph follows the definition of psychology, whereas it describes a propensity to support a specific outcome (May, 2021, 3).

Individual, as well as group Identities are therefore never static. Even if they appear somewhat constant over several generations in times of stability, they remain part of permanent interdependencies within several layers of complex systems, comprised of infinite facets of their socio-economic, environmental, and personal spheres. Therein lies the premise that no individual or group identity, past or present, can be accurately portrayed or understood by emphasizing solely on aspects of their class, religion, gender, age, or ethnic identity. Rather as an intersecting combination of all potential and accessible group identities existing inside and impacted by various other complex systems (Fernández-Götz, 2014, 13-14).

Complexity in archaeology has been conventionally related with social complexity and focused primarily on comparing societies as states, with supposed simple societies as chieftains or tribes (Draems, 2021). This notion directly inspired schools of thought, such as neo evolutionary theories, which early on came under scrutiny for their western centric perspective of complexity, among other issues (cf. chapter 6.1.4.2; also: Sahlins, 1968; Renfrew, 1982, 1-5; Fernández-Götz, 2014, 32-33). Importantly, any societies innate complexity is only one aspect of complex system theory and societies should never be valued against one another based on a prejudiced understanding of complexity.

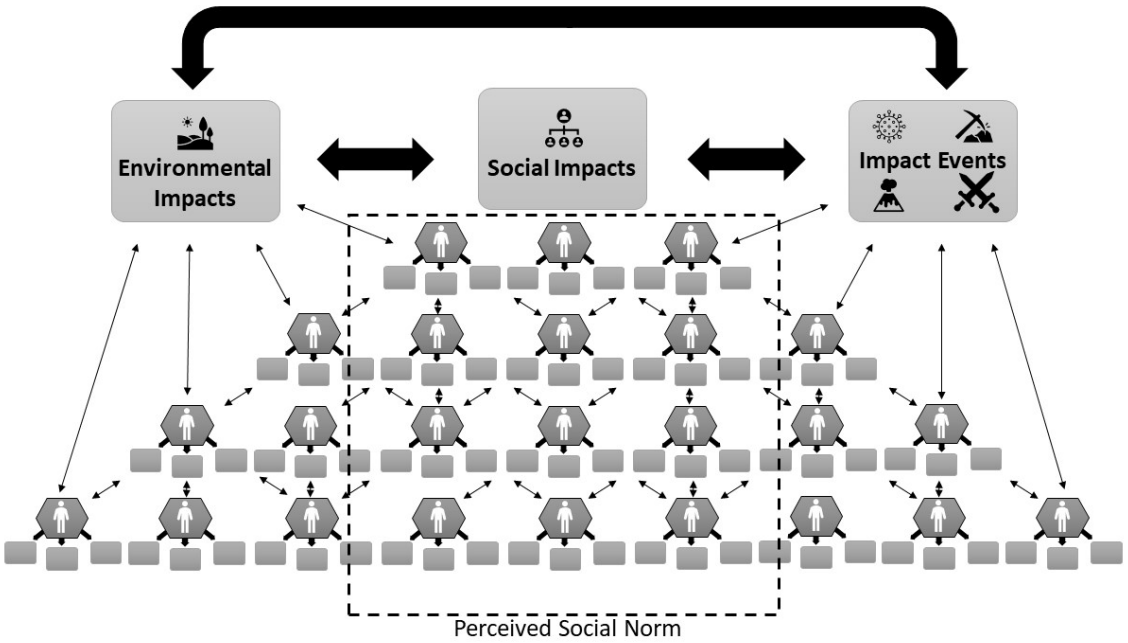


Fig. 4: As individual identities format and change, they inevitably, yet inconsequentially, shape group identities into a multilayered, complex system that is a social group.

In theory, a complex system is any system comprised of a large number of correlating components. This could be the global climate, a communication network, a natural habitat, or a network of settlements. While this thesis is not a study of complex systems or social complexity, it is still essential to recognise that identity formation, reinforcement, and transformation, on both a personal and collective level, are part of several layers of complex systems (fig. 4). Because of the overarching

interdependencies of identity with the environment, social structures, collective social dynamics, and individual agency, it can easily be argued to be a complex system on its own. As a result, both group and individual identities are constantly changing, as they are deeply intertwined with a plethora of connotations and variations depending on the context. This framework, while always incomplete, accumulates from the time and space a group exists in, as well as a large variety of socio-economic aspects on the macro and micro level.

This implies that highly dualistic conceptions of identity, such as the false dichotomy of orthodox Abrahamic gender roles, are implausible. This argument's inevitable ideological connotation leads to the next issue for any research on identity, the equally inescapable intersection of identity, archaeology, politics, and personal bias.

2.2.2 Identity: A Fundamentally Political and Subjective Issue

Identity, as a concept, has an inevitable inherent political connotation (Meskell, 2002). Many comprehensive features of identity, such as the individual agent's place within a structure or the overlapping nature of group identities, are inextricably linked to the construction of institutional provisions, power dynamics and social practices (Davis, 2008; Fernández-Götz, 2014, 14-15; Popa, 2018, 56-57). By proxy, political issues like gender and class inequality, or the exploitation of archaeology for nationalistic and androcentric purposes will come up, even if this is not the intention. This should not be surprising, given that most human political strife throughout history has been either directly related to identity issues (e.g., class conflict, ethnic conflicts) or substitutional, when real issues such as the struggle for resources required an emotional catalyst (cf. Cook-Huffman, 2008). Even though conflicts based on identity seem to be a recurring theme in history, the term 'identity' has only become as common and ideologically charged as a part of 'identity politics' in the last 20 years. This political approach describes social movements characterised by the independence or recognition of group identities from minorities as well as the right to choose one's own identity, on the one hand, and the purported protection of traditional homogeneous national identities, on the other (Kobayashi, 2020; Drozdzewski and Matusz, 2021). This global conflict of identity politics was controversially predicted by Francis Fukuyama (1992), and by now has become one of, if not, the defining political and ideological contemporary struggle.

This strife and overpoliticization of identity issues are things we as researchers cannot ignore just for the sake of neutrality. Whole scientific fields are already directly impacted, as the ban on gender studies in Hungarian universities enacted by the extreme-right Orban regime exemplifies. (APA, 2018; Petö, 2018). It is likewise not a coincidence that the concept of 'intersectionality' (cf. Davis, 2008; Hill Collins and Bilge, 2016) was first formulated by the civil right advocate, law professor and political philosopher Kimberlé Crenshaw (1989). Her concept was originally intended to illustrate how the

intersectional nature of identities correlate to systematic oppression and discrimination. Specifically, how struggles of women of colour must fall under the umbrella of both feminist and anti-racist discussion. Crenshaw, Gotanda, Peller, et al. (1996) notably also formulated 'critical race theory', a cross disciplinary theory and movement that primarily seeks to examine the intersection of race, society, and law. Despite its initial intention, the theory has morphed into a political friction point in the U.S., as since 2021, 33 states have introduced or pre-filed 122 bills that censored the teaching of 'critical race theory' and similar identity related topics in schools (Gross, 2022; Sachs, 2022).

2.2.3 Bias Implementation and Subjective Research Interference

Archaeology has its own history of ideological bias-driven misuse. Based on the aforementioned past and present nationalistic instrumentalizations of ethnic interpretations in archaeology (cf. i.a.: Legendre, Olivier, Schnitzler, et al., 2007; Heyd, 2017; Gavranoivic, 2018; Gimatzidis, 2018), the significance of an "ethical archaeology" (Meskell, 2002) is morally undeniable. Archaeology has an important and active role in present day culture, as it highlights discourses of gender inequality, nationalism, globalism or postcolonialism. That being said, the discrepancy between scientific objectivity and neutrality in relation to political biases remains. Moreover, some archaeologists (McGuire, 2002, 12) contend that it is impossible to take a politically impartial stance on the nature of society or problems regarding how scientists analyse society. This implicit inevitability carries its own issues, as it insinuates that every social and historical scientist would overdetermine his ideological (or religious) identity, or political aspects of their class, gender, age, and ethnic identity, while neglecting his or her occupational identity. In other words, his or her scientific responsibility. Ignoring that all these aspects of identity are part of any person's individual identity. Not only those that are political. Apart from that, within the intersection of ideological and occupational identity lies a fundamental discrepancy, as any implemented ideological research bias and scientific objectivity are contradicting concepts.

Cognitive bias is a manageable, fundamental human cognitive trait that helps people find similarities and deal with obstacles in life, not an abnormality (West, Toplak and Stanovich, 2008; Haselton, Nettle and Andrews, 2015). Albeit commonly abused in public debates to imply ignorance and prejudice toward an opposing argument, 'bias' is a scientific term. Bias, or more precisely cognitive bias, is defined in psychology as a tendency to favour a particular conclusion, which impairs the rationality of judgement (Haselton, Nettle and Andrews, 2015). In general, presumed biases affecting the sciences are not limited to ideological biases or social sciences. On the contrary, as past studies suggest (cf. May, 2021), not only are political biases as evident in scientific sciences as they are in social sciences, but they are furthermore less prevalent than biases towards social and financial gain. Nonetheless, based on the alleged inherent ideological connotations of archaeological studies concerning past

identities, it could be argued that any such research is especially vulnerable to ideological research biases.

One way to solve this conundrum is to differentiate between intended and unintended research biases. Intended implemented biases and politicization of archaeology are both, important on an ethical public level and simultaneously an issue on a pure scientific level. As a result, a division of the discourse seems ideal: one ethical discourse in public and another internal one, ideally purely evidence based. There is no need for overprotective, bias-driven scientific practices and argumentation on an internal scientific level. For instance, we should not demonise more traditionalistic or conservative social theories in general simply based on our own political biases. We should rather deal with such theories as we would deal with any other source we encounter, by assessing them critically and being aware of our own and any past researchers' biases. On the other hand, when communicating with the public, we must acknowledge our responsibility. This is something that especially German speaking archaeologists are very aware of, considering our research history (Heyd, 2017). It is therefore a question of responsibility within this public debate that archaeology remains ethical and thus politically aware.

Unintentional implemented research bias and circular reasoning, however, is another matter. Constant vigilance over this issue is the most fundamental tactic. The debated inevitability of political, personal, and subjective elements of identity research, however, presents such an awareness as a leap of faith when viewed from the outside. Consequently, research on identity needs additional independent validation and control mechanisms. A common way to introduce such mechanisms is through interdisciplinary methodologies that come with their own set of scientific validation and verification techniques, like the clustering procedures used in this thesis.

2.2.4 Quantitative Archaeology: A Methodology for Reducing Subjective Layers

Additional scientific validation and verification tools are just one upside for quantitative approaches in archaeology. Particularly when presented with huge quantities of highly fragmented material, quantitative archaeology provides a proper approach for addressing complexity. Utilizing statistical methods to investigate archaeological topics is by no mean an innovative concept (Shennan, 1997; Baxter, 2003). However, the recent emergence of data science as a scientific discipline is sometimes overlooked. Data science today is a multidisciplinary scientific area. It provides numerous methodologies, procedures, algorithms, and systems for extracting insights, patterns, and results from both structured and unstructured data (Cao, 2018). Various of these techniques, including different clustering procedures, have been extensively explored and are now an intrinsic element of numerous scientific and economic fields (Bacher, Pöge and Wenzig, 2010).

Recent decades have witnessed the emergence of quantitative archaeology and archaeological modelling as distinct subfields of interdisciplinary research (Nakoinz and Knitter, 2016). As stated, several archaeological studies used these sets of methodologies to explore a wide range of issues, including group identities (Hausmair, 2015; Tremblay Cormier, Nakoinz and Popa, 2018). A reason for this is that statistical approaches can depict group identities in a much more reasonable distribution than traditional heuristic methods and help identify their connection.

Quantitatively assisted sciences have a range of verification and validation techniques at their disposal to ensure the validity of statistical results while minimising researcher bias and interference as much as feasible. There are three fundamental principles that serve as the foundation for any statistical application in archaeology.

1. Statistical analysis is a tool. It is a means to reveal patterns. Particularly within large bodies of data that couldn't be analysed without the assistance of computing tools, these patterns are still solely up to the researcher to interpret. If a result obtained is interpreted in an implausible or intentionally misleading manner, it is not the fault of the method but of the researcher.
2. Statistical analysis is never objective. For any researcher who uses statistical analysis, there are still several unavoidable subjective interferences. The most obvious one is the aforementioned interpretation of statistical results. To understand two other essential subjective layers, it must first be recognized that any statistical investigation needs a database and a statistical algorithm. In connection with the database, there is a wealth of individual subjective decisions, such as the basic structure, which data is used, table descriptions, relationships, or even the choice of which programme to work with. Likewise, an algorithm is written by a person. While it is definitely an advantage if an archaeological researcher is able to write a specific algorithm by himself, there are alternatives. If prefabricated algorithms are used, either within a cooperative interdisciplinary study as in this thesis or if a freely usable algorithm is applied, this algorithm must be understood in any case. At least in how it computes and shapes the final results. A computer neither knows how to calculate by itself nor determines for itself which values are used in a calculation (Shanks and Tilley, 1992, 111-114; Popa, 2018, 57-58).
3. Lastly, a statistical analysis should only be applied with a definitive question at hand and a comprehensive understanding of the context related to the question. As aforementioned, statistical results must always be interpreted; they are not self-explanatory. Especially within archaeology, any obtained statistical result is itself part of a complex dynamic system that is within another complex dynamic system composed of past human societies, their manifestation in material culture, and their environment. Only when such an analysis is based on a question or hypothesis supported by a solid foundation of context and theory can

plausible and useful results be obtained and ultimately interpreted (Shennan, 1997, 216; Popa, 2018, 57-58).

Any subjective researcher's intervention can be significantly reduced from the start after acknowledging these fundamental limits and outlining every step of the method as transparently as possible. There are also a number of foundational statistical tools for analytical validation. The standard and relative standard deviations, confidence intervals, regression analysis, and the mean or average of a data collection are a few examples. All of these tasks are usually carried out automatically by employing statistical software applications such as R or SPSS (Belouafa, Habti, Benhar, et al., 2017). Another key feature of any statistical application is the initial quality of the employed data (cf. chapter 9.2).

As most quantitative procedures, hierarchical cluster analysis as applied in this thesis, has its own validation tools, such as similarity indices (Dunn, 1974a; Dunn, 1974b; Rousseeuw, 1987; cf. chapter 11.1). Due to the flexibility of the method, there are several supplementary validation practices depending on the application. For instance, the clustering processes resembles a scientific experiment, since these are repeated hundreds of times in various specifications. Additionally, the obtained cluster are validated in three ways: first by the aforementioned indices, second by empirically contrasting the clusters with the established archaeological context and finally by integrating the cluster groups into georeferenced maps for spatial analysis. All these mentioned practices will be described in greater detail in the second methodological chapter that focuses on the actually applied method (cf. chapter 10).

2.3 Missing Links: Kindship Analysis, Landscape Archaeology & Other Scientific Studies

In order to conclude this chapter, it is necessary to discuss those contextual components of group identity that are noticeably absent from this study. A range of pre-existing scientific and landscape archaeology investigations would be ideal for optimally researching and grasping the level of intricacies related to individual and group identities. This is particularly true for studies that investigate the interdependence of human interaction and their living environment. Such preceding and often interdisciplinary studies that any researcher could access are frequently unavailable due to their relative scarcity and expense. This is also true for the Traisen Valley.

In contrast to the rich archaeological research history (cf. chapter 5.1), there is an absence of regional archaeological landscape studies that can be found for other Austrian La Tène sites. Among these are archaeobotanical studies (cf. Kohler-Schneider, Caneppele and Heiss, 2015, for the La Tène site at Sandberg-Roseldorf), ALS based prospection that also assist in deducting paleochannels, -topography or terrain models (cf. Doneus, Fera and Janner, 2015 and; Zámolyi, Draganits, Doneus, et al., 2015, for the Leithagebirge) or wide ranging landscape studies on a regional (cf. Hellmuth Kramberger, Mele and

Modl, 2019, for Iron Age Settlement dynamics in the Sulm Valley, Styria) and micro regional level (cf. Tiefengraber and Tiefengraber, 2019, for the Iron Age site in Strettweg, Styria). Exception to this are studies on settlement hierarchies and classification on North-East Austria's La Tène Period by Raimund Karl (1996) and Peter Trebsche (2014), that incorporated Traisen Valley sites, in particular Inzersdorf-Walpersdorf.

Another missing link are studies related to 'Spatial Interaction' (cf. Nakoinz, 2013b; Nakoinz, 2013c). This concept defines 'interaction' as a link between space, social relationships, and group identities. The concept of 'Spatial Interaction' relates to several scientific subjects, all with their own specific focus (cf. for various examples: Malinowski, 1922 for ethnology; Stewart, 1950 for geography; Renfrew, 1977 for archaeology; Blumer, 1986 for sociology; Garrod and Pickering, 2009 for psychology; Nakoinz, 2013b, 107-108, for a comprehensive overview). 'Interaction' is generally characterised by both communication, hence the exchange of knowledge, and interaction, in the form of cooperation between at least two individuals (Nakoinz, 2013c, 72). Interaction correspondently exists, according to Oliver Nakoinz (2013b, 107), as; "the main driver of historical, cultural, social and economical processes." Furthermore, he considered that without interaction; "there would not be any social or economical practise, no cultural formation and no mentionable history to describe."

Since all these quintessential dynamics exist within a perpetual feedback loop of interaction and reaction, they consequently impact group and individual identities in a similar perpetual way. Which is why 'Spatial Interaction' should be, in theory, vital for any identity related studies since any human interactive processes crucially participate in identity formation and reformation processes (cf. 5.2.3.1 and 5.2.3.2). Ranging from an individual providing landscape features, erected monuments as burial mounds, or even social networks with symbolic meaning (Hodder, 1978; Hodder, 1982; Blumer, 1986), to macro dynamics such as trade, migration, or diffusion (Nakoinz, 2013b).

Human interaction in their habitat and beyond can manifest in uncountable ways. Consequently, research on 'spatial interaction', is often accompanied by quantitative methodologies, like characterizing landscape quantitatively through fuzzy categories (Popa and Knitter, 2016), studies on central places that incorporate reconstruction of hierarchies and analysis of centralization processes and system analysis (Nakoinz, 2009; 2013d), social network analysis (Knappett, 2013) and various other modelling approaches for interaction (Nakoinz, Knitter, Faupel, et al., 2020). All these studies attempt to embed theoretical contexts with analytical workflow and consequent analytical results. Albeit their absence on a regional level, if pre-existing studies correlate on a trans-regional and chronological level with the research area, they at least can be integrated as analogies or deduction tools for the final interpretation. Oliver Nakoinz' (2013a; 2014) research and revaluation on cultural definitions, hierarchies, and territories in relation to the Late Iron Age, South-West German "*Fürstensitz*" or

princely seat phenomenon (cf. 7.2.2.1), for example, allows for implications on social structures and hierarchies in peripheral interconnected areas such as the Traisen Valley.

In terms of their essential ramifications on social identity, any form of kinship analysis is among the most missing elements for group identity research. Pre-existing analyses, such as that of the La Tène cemetery of Münsingen-Rain (Alt, Jud, Müller, et al., 2005), are generally still a rarity. Kinship is an ongoing study topic across all anthropological subdisciplines at present. Consideration of kin-based social organisation can enhance a broad range of historical study subjects. Specifically, bioarchaeology has the potential to contribute significantly to the field of kinship research (Johnson and Paul, 2016). In light of recent advances in sociocultural kinship studies, bioarchaeological approaches to kinship have challenged many established paradigms of how we comprehend family. It remains, for instance, doubtful that Western conceptions of biogenetic relatedness represent the diversity of family organisation that existed in the past. To access this diversity and posit examples of non-biological forms of kinship, scholars are beginning to employ larger, more flexible concepts of relatedness (Pilloud and Larsen, 2011; Gregoricka, 2013; Johnson and Paul, 2016). Any such interdisciplinary study can contribute to our understanding of the changing biological and social realities of kinship, regardless of time periods. Such an understanding could inform sociocultural theory, which frequently implies that the spectrum of human experiences comprises all types of human experience. A bioarchaeology of kinship as multiscalar social identity has the ability to bridge academic divides and enhance any interdisciplinary and holistic research on group identities (Johnson and Paul, 2016).

3 Archaeological and Theoretical Research History

This chapter will serve as a broad outline for both the archaeological and identity-related theoretical research histories. The first part is straightforward, as it depicts all relevant aspects of the archaeological research history for the three Traisen Valley cemetery sites. The second section presents the traditional irritation and consequent clarification attempts of what the ambiguous term 'identity' means and consequently indicates. This is complemented by an exposition of the changing historical research positions and several emerging identity theories from archaeology and other relevant contemporary humanities.

3.1 Iron Age Research History in East Austria

The earliest interest in Lower Austrian Iron Age material culture can be traced back since at least 300 years (Neugebauer, 1992, 12-13; Ingamells, 1997, 779–780; Ramsl, 2020a, 71). From the middle of the 19th century onwards, the curiosity in prehistory did ultimately go beyond private collectors and preliminary stages of scientific research started to emerge (Neugebauer, 1992, 14; Nebehay, 1993, 4; Trebsche, 2020b, 21). Lastly, research History in its literal sense finally begun in the last phase of the

19th century and centred around the founder of the Chair of Prehistory at the University of Vienna, Moritz Hoernes. Among many aspects of his oeuvre, he established East-Austrian La Tène research, when he allocated 12 previously known Lower Austrian sites to be La Tène period (Hoernes, 1889; Neugebauer, 1992, 14). Consequent publications and excavations that followed are e.g., the dissertation about La Tène period in Lower Austria by Max Zehenthofer (1916), or a number of publications on La Tène sites in the Leithagebirge, such as Au (1930) or Mannersorf (1916), by the latter's site mayor Alexander Ritter von Seracsin. From that time onwards Iron Age research history in Lower Austria gradually and steadily developed into its modern variant. Notwithstanding the scientific recess that came with the NSDAPs seizure of power and consequently World War 2 (Neugebauer, 1992, 15).

Since Seracsin initial publications (1916; 1930), a number of Iron Age cemeteries and settlements have been located on the Leitha hills western side, along the terraces above the river Leitha (Ramsl, 2020b; 2020a). Among these are modern studies on the aforementioned Mannersdorf (Ramsl, 2011) and Au (Nebehay, 1973), as well as Göttlesbrunn (Karl, 2015) or, just beyond the Lower Austrian border in Burgenland, sites like Loretto (Nebelsick, 1994) and Pöttsching (Ohrenberger, 1956-1960; Melzer, 1961–1965). Thanks to extensive prospection via airborne laser scanning (ALS) done in course of a FWF Project (P1644) by Doneus, Fera and Janner (2015), there will be no future lack of previously unknown sights. Besides the Leithagebirge, further noteworthy Iron Age sites in Lower Austria are, for instance, flatland settlements such as in Haselbach (Trebsche and Fichtl, 2018) or Roseldorf (Holzer and Stadler, 2008), as well as hillforts like the Leopoldsberg in Vienna (Urban and Cech, 1999), Gars-Thurnau (Karwowski, 2018) and the Oberleiserberg (Karwowski, 2012).

3.1.1 The Traisen Valley

La Tène sites within the research area came into scientific focus as early as 1891, with the discovery of famous figural decorate Kuffern [2] Situla, in-between the Traisen River and the western Flatnitz stream (cf. Neugebauer, 1992, 15; Urban, 2006; Trebsche, Bagley, Karwowski, et al., 2020, 468-469). The valleys archaeological importance goes far beyond the iron age. The earliest population heyday, verifiable by peaks in burial and settlement activity, took place in the Early Bronze Age, whereas human activity can be documented from the Early Neolithic period onwards (cf. Blesl, 2012; Ramsl, 2020a, 71). Arguably the most important contribution in exploring the Traisen Valleys rich archaeological landscape should be accounted for the late Johannes-Wolfgang Neugebauer (cf. i.a.: Neugebauer and Gattringer, 1982; Neugebauer, 1996a; Neugebauer, 1996b).

[2] At that time known as Kuffarn.

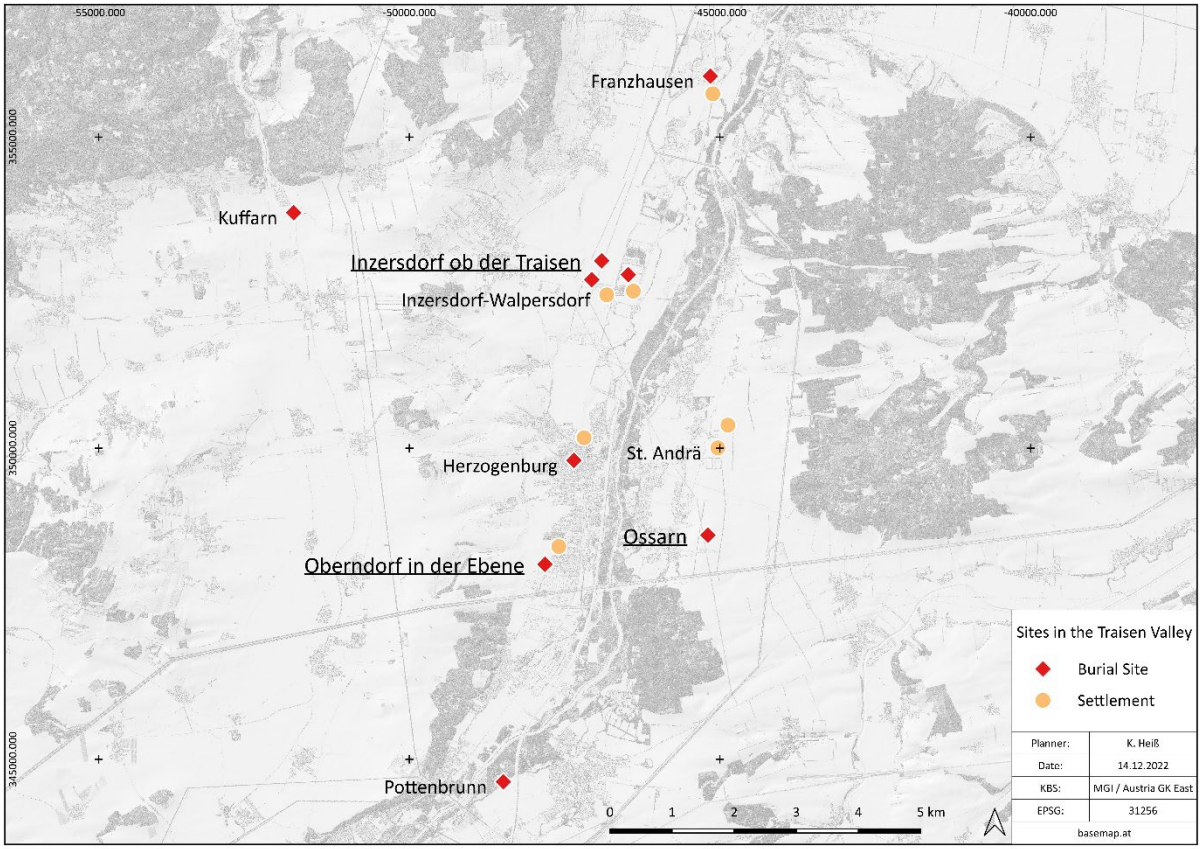


Fig. 5: Location of the three sites under investigation in the Traisen Valley, as well as related cemetery and settlement sites that have a chronological relationship.

Neugebauer spearheaded decade long excavation campaigns, specifically during the construction of the S 33 motorway (cf. i.a. Neugebauer and Gattringer, 1981; 1982; 1984; 1985-1986). During these initial excavation boom periods, up until today, a substantial number of Early Iron Age or multiphase cemeteries, such as Franzhausen (Neugebauer and Gattringer, 1993, 446-448), Kuffern (Nebehay, 1993, 8-26 and 88), Gemeinlebarn (Eckkrammer-Horvath, 2015), Herzogenburg-Kalkofen (Nebehay, 1993) or Pottenbrunn (Ramsl, 2002), as well as tumuli such as Rassing an der Persching (Preinfalk, 2005) or settlements at Franzhausen (Neugebauer, Gattringer, Blesl, et al., 1991), Angern (Neugebauer and Gattringer, 1985-1986) or Gemeinlebarn (Neugebauer, 1994a), have been excavated and researched. Only to name the most essential and withholding Oberndorf, Ossarn and Inzersdorf that will be presented in the following sections. This large number of investigated sites will only increase further thanks to extensive construction activity in the Valley and consequent rescue excavations almost every year (e.g., for Oberndorf: Morschhauser, 2012; Kultus and Kultus, 2021). Due to that constantly growing number of excavations, many of these still remain unpublished outside of mandatory yearly reports by the Federal Monuments Office (*Bundesdenkmalamt* or BDA in German).

3.1.1.1 Oberndorf in der Ebene

Until recently, 5 mayor rescue excavations have taken place at the Oberndorf cemetery site during several campaigns (fig. 6). The first of these occurred due to above mentioned constructions of the

motorway exit at Herzogenburg Süd in between the years 1982 and 1983 (Neugebauer and Gattringer, 1982, 66-67). The site itself was a gravel pit south from the motorway, wherein 23 La Tène inhumations buried within 18 graves, four cremations, as well as additional 12 Hallstatt cremations were excavated. Three years later, in 1986, E. Wallner discovered an iron linch-pin with a bronze head adorned in form of a mask as a stray find in close proximity of the cemetery (Megaw, Megaw and Neugebauer, 1989, 491-492 and 506-513; Neugebauer, 1992, 41; Ramsl, 2020a, 77).

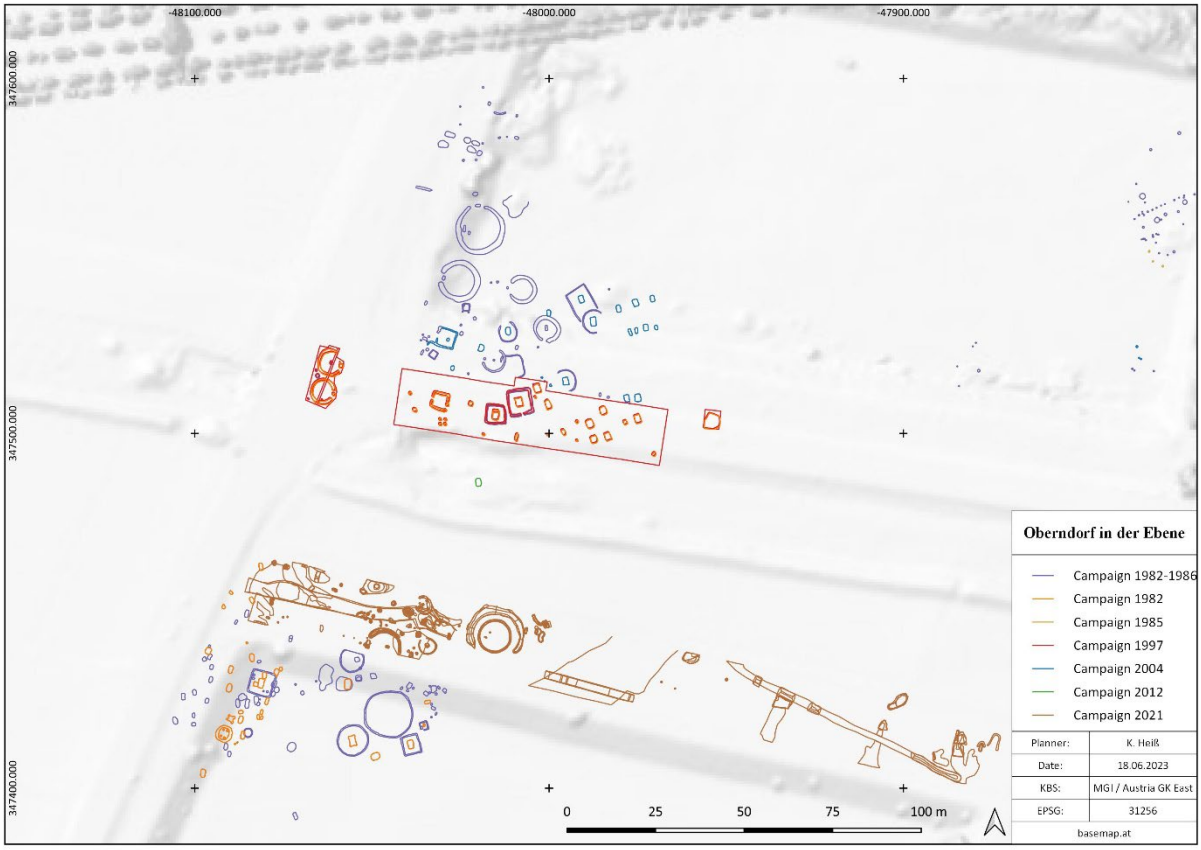


Fig. 6: A map of all documented excavations at Oberndorf in der Ebene since 1982 that combines all provided DWG files.

In 1997 in course of a watching brief conducted by Neugebauer and Blesl (1997), due to a construction project southwest of the motorway S33 exit, a number of settlement structures surfaced at the lower terrace edge of the Traisens former alluvial sand. Among a number of archaeological structures, such as postholes or foundation trenches that mostly dated to Bronze Age urnfield culture and late antiquity, the only settlement structures in conjunction to the Oberndorf cemetery to this day were located. More precisely, two pit houses and a storage pit (Neugebauer and Blesl, 1997).

The next rescue excavation campaign took place in 2004, following a request to open another gravel pit by the company (Franz Oberdorfer GmbH) that owned the listed areal at the Oberndorf cemetery site. During this campaign, headed by Christoph Blesl and Alois Gattringer (2004), 11.121 m^2 were excavated and not only revealed further sections of the Iron Age cemetery, but also parts of the Roman necropolis and the Early Bronze Age settlement. Within the late Hallstatt, early La Tène burial ground

further 16 inhumations and two cremations were located. Additionally, it was understood that during this excavation the Iron Age cemeteries north-eastern occupancy edge was reached (Blesl and Gattringer, 2004).

Over the last decade two further rescue excavation occurred. The first in 2012 by the excavation company 'ARDIG' under direction of Günter Morschhauser (2012), in part investigated the unexplored zone in between the excavation areas of 1982 and 1983 (cf. fig 6). The approx. 1150 m long and 20 m wide west-east sustained section incorporated 8 cremations that either date to late La Tène or Roman periods, as well as one definitive La Tène inhumation. Further east of the iron age section area, additional traces of the Bronze Age settlement were discovered along with high and late medieval occupancy. Whereas west of the iron age burial ground 8 early medieval inhumation and one Bronze Age storage pit were identified (Morschhauser, 2012).

The second and last rescue excavation to this date, took place only in 2020/2021. This campaign was conducted by the excavation company 'ASINOE' and headed by Katharina and Marco Kultus (2021). Not unlike the 2012 excavation the section was mostly west-east sustained and incorporated an area of 9900 m^2. This campaign again brought a large number of structures and graves to light, incorporating all previously known eras, yet also a Neolithic Epilengyel cremation. As for the Late Iron Age burial ground, further eleven cremations, one inhumation and a ring ditch were excavated (Kultus and Kultus, 2021).

3.1.1.2 Ossarn

Located on a lower terrace on the opposite bank of the river Traisen, the Ossarn cemetery has been researched since the 1960s. While not as comprehensively investigated and published as many neighbouring sites, the Ossarn site still is a prominent part of the Traisen Valley research history. Particularly as for a significant finding in grave 17/84, a juvenile female inhumation. Among other noteworthy objects as a patched twisted bronze bracelet or torques, as well as a belt hook with richly decorated box-shaped application that all will be described in further detail later on (cf. 9.5.2), most prominent is a bronze wire fibula, which is figuratively decorated with a unique sphinx-like human hybrid creature (Neugebauer, 1992, 41; Ramsl, 2020a, 77).

Six excavations have happened in Ossarn as of now, in which three campaigns occurred more or less consecutively, in the 1960s and 1980s respectively. The initial three occurred in 1963, 1966 and 1969 and have been published by Kristin Engelhardt (1969; 1976). As with Oberndorf, the burial ground was at that time located in a gravel pit. Over the course of all three campaigns combined, 8 Early Iron Age inhumations could be recovered. After these initial excavation years, it took until 1982 and the construction of the motorway S33 that again three consecutive campaigns in 1982, 1983 and 1984 were headed by Wolfgang Neugebauer and conducted by Alois Gattringer (1983; 1984; 1985-1986)

and Christa Farka (Megaw, Megaw and Neugebauer, 1989, 480). Even though Neugebauers suspected that a large number of graves were destroyed in between the 1960s and 1982, 18 further inhumations, among them the above mentioned grave 17, were excavated and consequently published (Megaw, Megaw and Neugebauer, 1989, 479-491; Neugebauer, 1992, 41).

3.1.1.3 Inzersdorf – Walpersdorf

Last but not least, the prehistoric settlement and cemeteries that extended over the modern cadastral districts [3] Inzersdorf ob der Traisen and Walpersdorf, are both part of the municipal Inzersdorf-Getzersdorf (Ramsl, 1995; Morschhauser and Pollak-Schmuck, 2021). All three sides are in direct proximity to each other. As with similar contexts in the valley, the settlement was located at the western lower terrace edge of the Traisen River, whereas the burial grounds were set up further west in the direct hinterlands (Neugebauer, 1992, 47).

First discoveries of Iron Age archaeological context surface at the turn of the 19th and 20th century. First, in 1895 and 1899, when A. Zündel and J. Schmidt, respectively, conducted altogether five inhumations, a number of settlement pits surfaced in proximity to the same train gravel pit. Nine inhumations and another settlement pit were excavated in 1900 and finally in 1923 one more inhumation burial was found. These 13 burials, that were originally mistakenly published being from Getzersdorf, incorporate one double burial and date in between LT B and LT C (Neugebauer, 1992, 42; Neugebauer, 1996b, 112).

Besides further reports on the settlement by Johannes Offenberger (1960-1965), Clemens Eibner (1961-1965; 1967; 1971) and Alois Gattringer (1977; 1978), a veritable quantum leap in researching Inzersdorf ensued in the 1980s (Ramsl, 1995, 9; Neugebauer, 1996b). Simultaneously two rescue excavation during 1981 and 1982, that yielded an extensive number of Early and Late Bronze Age settlement structures and burials (Neugebauer and Gattringer, 1981; 1982), further rescue excavation campaigns headed by Otto H. Urban (1981; 1982), discovered approx. 1100 additional settlement traces, dating not only to Early and Late Bronze Age, but also into Early Iron Age phases (Neugebauer, 1996b, 112). The massive extend of Inzersdorf – Walpersdorf necropolis only became apparent in the summer of 1982, after the area was recorded via aerial photography (Neugebauer and Gattringer, 1983, 56, cf. fig. 23/2). Five years later, 1987, an eastern extension of this necropolis was therefore excavated, again due to immanent gravel mining in this area. Among 22 objects documented, 11 inhumation and a single cremation dated to Early La Tène were documented (Neugebauer and Gattringer, 1987, 38, fig. 22-28; Neugebauer, 1992, 47; 1996b).

[3] Kastralgemeinden or KGs

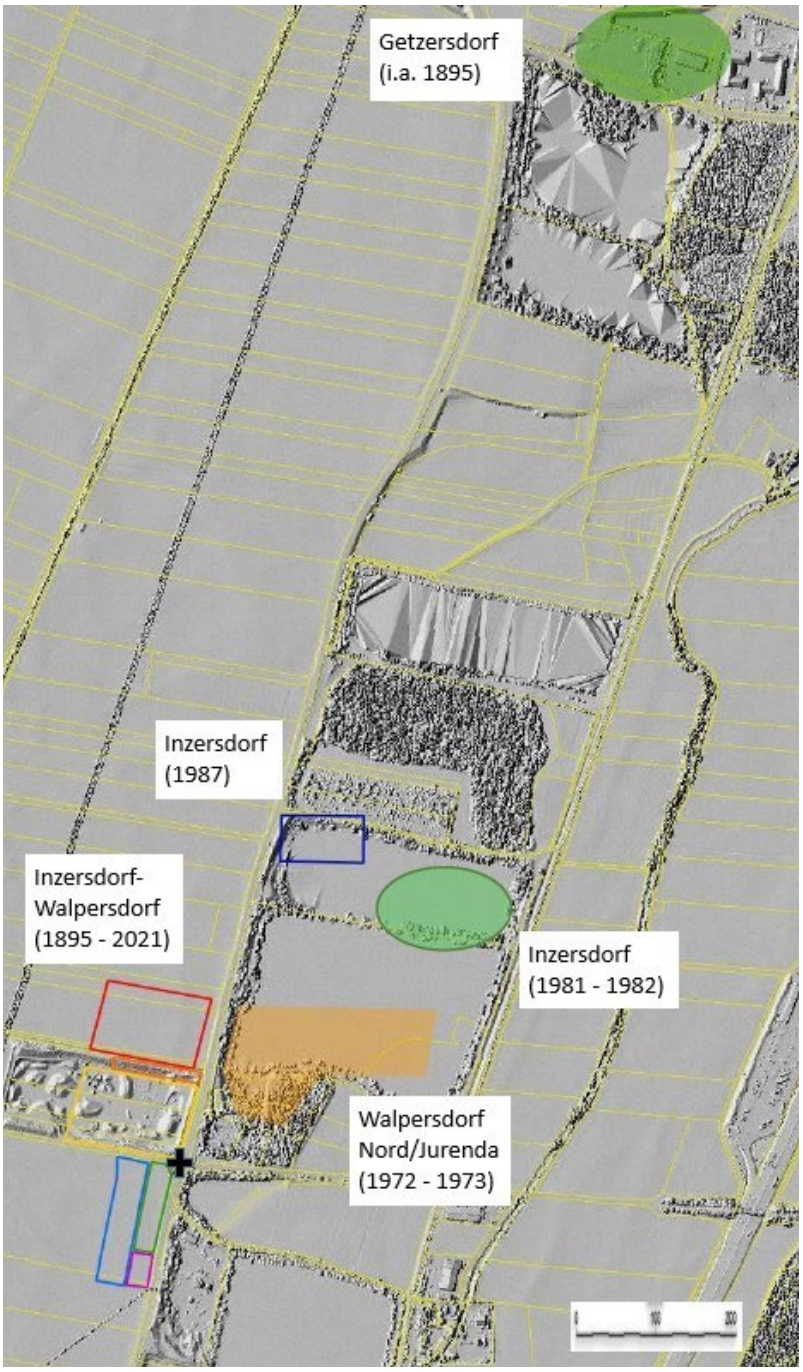


Fig. 7: Plan of the excavation campaigns in the vicinity of the Early Latène cemetery at KG Inzersdorf and KG Walpersdorf, edited on the basis of an original, provided map by Peter Ramsl.

The use of plural for the term 'cemeteries' in this subsection opening sentence was done purposefully, as the Inzersdorf-Walpersdorf Early Age phase does in fact consists of two burial ground areas. Only approx. 500 m south-west of the above described cemetery area excavated in 1987 (cf. fig. 7) (Neugebauer, 1996b), another burial ground was discovered and excavated from 1997 onwards up until today. Although a direct correlation to the north-eastern cemetery and the settlement (Ramsl, 1995) is not yet verified, it is deemed likely (Morschhauser and Pollak-Schmuck, 2021, 58). The first rescue excavations were conducted in between 1997 and 1999 and led to the discovery of further 9 inhumations and 8 cremations, dating to Early La Tène (Neugebauer, Blesl, Gattringer, et al., 1997; Neugebauer and Gattringer, 1998; Neugebauer, Blesl, Einwögerer, et al., 1999). After the turn of the millennia, a number of rescue excavations transpired, most of these done by the rescue excavation company 'ARDIG' (cf. i.a.: Raab, 2017; Morschhauser and Pollak-Schmuck, 2021). Since all of these campaigns only have been published as preliminary reports, as well as for time constraints regarding this master thesis, data attained during these excavations were not incorporated into the clustering process. Based on first results presented within these reports show promises of a research rich future, given that only within

this burial ground area alone, if all excavation from 1997 are incorporated, 136 Early La Tène burials are evident (Morschhauser and Pollak-Schmuck, 2021, 66).

3.2 Introducing Identity, or What is 'Identity Theory'

Besides the archaeological and general context, 'identity theory' is the main aspect that should allow a proper application of subjective facets within the quantitative modelling process, as the weighing process or the final interpretation of the final clustering groups. Furthermore, what often is summarized as; 'identity theory' throughout this text, is not a coherent established theory, as there is no larger, recognized 'identity theory'. Rather, a substantial number of discipline-specific 'identity theories' (cf. Davidovic, 2006). These encompass a variety of theories that touch upon the broader scope or distinct aspects of identity, all relevant to each scientific field. The primary definition for identity within this thesis, is the collected set of all individual group identity aspects, subjectively perceived and represented by the buried individual's community and manifested in funerary contexts. Using clustering procedures, it should be possible to accumulate all these individual compositions of group identities into an approximate interpretation of the community's 'social norm'. As previously outlined, the term 'identity theory' will be used from now on only as a *termini technicus*. This will allow me to easily summarises all these different theories that concern Identity within the humanities and beyond.

3.2.1 Disambiguation of a Vague Term

This variety in potential interpretations of what identity allegedly is or should be, is a core issue with the concept of identity which will be addressed first. The somewhat controversial and ambivalent status that the term 'identity' has in our contemporary society and to some degree within the humanities, should not come as a surprise, as the word 'identity' represents itself as one of the most omnipresent yet vague conceptions of postmodernity (cf. Heinrich, 1996; Davidovic, 2006). It is a multi-layered concept that we encounter on many levels of our everyday lives. We face it as a symbol of individual self-determination, as a polemically used political term or as a marketing and campaign tool or simply a general buzz word. Multinational companies as well as your small local Start Ups are in need for an endogenous corporate identity and an exogenous brand identity (Balmer, 2008). Whole regions and cities strive for incisive and distinct regional identities, which themselves end up as ubiquitous labels in political campaigns, along with its use as a marketing tool in the food and tourism sector (Pohl, 2001).

As already discussed (cf. 4.2.2), identity is also inherently political by nature since many of its facets directly correlate with political aspects as formation of power dynamics and institutionalised oppression (cf. Meskell, 2002). It is for this reason that the overarching political approach of identity politics became the defining contemporary political struggle (Kobayashi, 2020). Triggered by

emotionally charged social friction points and building processes, this ideological strife finds its reflection in symbolically loaded, concrete and communicative actions. The consequent political, social, and cultural upheavals are not only reflected in often-regressive backlashes, but also within the struggle to deal with never-before-seen possibilities and freedom to construct collective and individual identities, and realities. This is especially recursive within youth, pop and minority cultures where numerous distinct subcultures are able to emerge and solidify their own unique group identities (Kimminich, 2003, 8; Beck, 2007).

Due to its versatile use, the term 'identity', depending of its relational usage, seems often rather ambiguous and implying (Wagner, 1999, 44). As the cornerstone of various processes, it is often used subsuming and simplifying towards variations of gender and age identities, ethnic and class identities, group, and individual identities, especially within the public discourse. All these and other aspects of identity are in reality deeply intertwined with each other but are seldom seen in this way by the broader public perspective. Using identity politics as an example, we can see that the term 'identity' frequently implies buzzwords, such as assimilation, acculturation, globalization or mono- and multiculturalism, often without proper explanation nor understanding. Similarly, various fields of the social, cultural, and more recently historical sciences, as well as psychology, traditionally approached identity in distinct ways. These theoretical approaches were often developed without considering other respective academic disciplines or the public perception and usage of the concept of identity. Consequently, not one but many theoretical concepts of identity emerged (Heinrich, 1996; Luckmann, 1996; Kimminich, 2003, 9; Díaz-Andreu, Lucy, Babić, et al., 2005; Eidson, 2019). Identity had evolved into a word that, as the archaeologist Antonia Davidovic (2006, 39) put it; is used inflationary in both everyday life and the general academic debate. This became a buzz word that encompasses a multi-layered and often contradictory emphasis. A view also shared by the sociologist Odo Marquard (1996, 347), as he already perceived in the mid-1990s an overuse of the academic discourse of identity, which often generates as much confusions as conclusions.

This ambiguity stems from the habit of the general public, as well as some scientists, to use the term identity as a synonym for various other terms, such as personality, ego, homogeneity, oneself, character, nature, etc. In archaeology for instance, the similarly vague concept of culture with its allegedly 150 own definitions (Kroeber and Kluckhohn, 1952), is i.a., very often used as a substitute for group identity or ethnic identity. Admittedly, this vague scientific usage of identity is somewhat consequential, as is widely used in numerous social theories and subject of scientific research in various fields. The seemingly simple task to comprehend the semantic history of the term identity, presents itself as a massive undertaking.

The anthropologist John R. Eidson (2019) addressed this task, by analysing over 700 texts in English, German and French from 1700 to the present. He concluded that, in its modern variation, the term identity emerged in three waves from a sequence of semantic innovations of the English term 'identity' and later cognates of different languages as German or French. As part of this process the term identity cooccurs with corresponded terms with similar meanings as e.g., 'character' and later replaces them. In the first phase, circa 1700, the personal identity of an individual emerged, in the second phase, from 1790 to 1840, the first attributed precursors of group identities beyond ethnicity or religion were described and in the last phase, from 1940 onwards, an individual's social-psychological identity associated with the society was defined (Eidson, 2019, 31).

The sociologist Peter Wagner (1999, 45), classified two variations of the term identity in the social sciences. One, '*Selbstidentität*' or '*personale Identität*', meaning individual identity, in the sense, as defined by the fundamental researcher for 'identity theory', the psychologist and psychoanalyst Erik H. Erikson (1968a, 61) as "a subjective sense of continuous existence and a coherent memory". The other variation corresponds with, '*soziale*' or '*kollektiver Idendität*', as in group identity. Wagner (1999, 45) defines this, as an identification of sameness, but also disparity (cf. 10.2.1) of humans with each other. Finally, the mandatory look into the last edition of the German encyclopaedia of sociology published by Klimke, Lautmann, Stäheli, et al. (2020) also provides two definitions of identity. Firstly, there is a definition in the initial philosophical sense, originating from lat. idem, defined as „*Selbigkeit oder das Gleichbleibende von etwas (eines Dinges, einer Person, eines Satzes usw.) mit sich selbst oder etwas anderem*." Secondly, as defined in psychoanalysis and social psychology: "*das dauernde innere Sich-Selbst-Gleichsein, die Kontinuität des Selbsterlebens eines Individuums (Ich-I., auch Selbst-I.), die im Wesentlichen durch die dauerhafte Übernahme bestimmter sozialer Rollen und Gruppenmitgliedschaften sowie durch die gesellschaftliche Anerkennung als jemand, der die betreffenden Rollen innehat bzw. zu der betreffenden Gruppe gehört, hergestellt wird."* (Klimke, Lautmann, Stäheli, et al., 2020, 326). While these definitions might clear up some of the ambiguity of the term, as Eidson (2019, 42) acknowledges "Identity means many things depending on a number of variables; and because there is no single concept of 'identity'". Further, he admits that it is a "word among words, corresponding to a set of related yet distinct concepts". Leaving semantic considerations aside, these concepts will be the next focal point.

3.2.2 Identity Theory in Archaeology

Attempting to define or assume group identities has been an archaeological practice since the beginning of cultural historical archaeology. Since archaeology in anglo-saxon traditions is part of anthropology, social anthropological 'identity theory' always had an influence on theoretical minded archaeologists. This applies loosely throughout the archaeological theoretical evolution. 'Cultural

historical' archaeologists, like Vere Gordon Childe (1927) who primarily focused on ethnic groups, were as much a product of their time, as the respective 'processual' and 'post-processual' archaeologists of the 1950s, 60s and 70s. In Childes era, identity and ethnicity were thought of as identical and studies did not approach these concepts in a sociological manner. Since only a few decades before this era our modern nation-states emerged from a nationalism based on supposed ethnic or racial commonalities, ethnic identity was seen as a historical certainty (Popa, 2018, 53).

Likewise, early 20th century sociologists and consequently archaeologists were either by choice or involuntarily bound to the ideological preferences of their respective countries and/or class. Gustav Kossinna for example, was himself part of antisemitic and '*Völkisch'* movements, as well as co-founder and patron of the 'Militant League for German Culture' (Grünert, 1992). To no surprise, Kossinna (1920) correlated sharply defined archaeological groups directly with race. Others as the Catalonian archaeologist Pere Bosch Gimpera (1922) differentiated these concepts and ignored the idea of races, yet still equated distinct archaeological culture with distinct ethnic groups. Although Childe (1958, 10) ultimately rejected Kossinna's equalisation of race, his assumption followed Gimpera's and further identified diffusion and migration as key parameters in social evolution and intersocial behaviour.

Besides attempting to identify archaeological cultures within the record, another primary focus of cultural historical archaeologies was to understand the spread of cultures and technology. The concept of identity had been seen as determined by society, with the individual playing a subordinate role. Like Vere Gordon Child (1927, 85) said, "it is immaterial if a group of people comes to a place, the relevance lies in that their material culture did". Even more than an individual man, women, children, or the elderly were considered irrelevant. As Magarita Díaz-Andreu (2005, 3) noted, the assumption of how advanced a culture was: "related to their degree of masculinity, objects associated with women, as well as children, were largely excluded from archaeological interests."

All these and many other problematic methodological and theoretical aspects, led to the paradigm shift that we know today, as 'processual archaeology' or 'new archaeology'. Led by English-speaking archaeologists, like Lewis Binford (1962), archaeology was considered to be strongly connected to anthropology, as simultaneously new scientific methods were introduced. Yet, aspects of archaeological cultures, as well as the coincidence of identity and ethnicity remained (Popa, 2018, 53-54). Only in the late 1960s, based on the ideas of Binford (1968, 16-23) or Fredrik Barth (1969), identity was acknowledged as a complex system of flexible, interplays of cause and effect. Identity was now understood to be formatted over a series of actively maintained but also constantly manipulated limits. This idea of perpetual instrumentalization, reduced identity to a simple tool to expand social and economic interests. This coincidently led to both questioning, but not denying, the traditional equation

of ethnicity with material culture, as well as to an overly functionalistic point of view, ignoring individual choice and expression (Jones, 1997; Popa, 2018).

The aim of 'new archaeology' was to infer behaviour via observation of archaeological sites and to understand their formation processes. Part of this were hypothetico-deductive methods, that included generalised analogies along with presumptions of the past, as well as testing of models and explicit quantitative approaches. As 'neo-evolutionary theory' was introduced to Processual Archaeology, the idea that societies evolve through several stages from an egalitarian society to a socially stratified society became prominent (Sahlins, 1968; Service, 1971; Service, 1975). While 'neo-' or 'social evolutionary theory' was criticized for applying evolutionary concepts into social theory, it also introduced for the first time, outside the Soviet Union, an archaeology of status or class (McGuire, 2002; Klejn, 2012). Yet in all this, individuals were still seen as obedient members of their group, a passive constant (Díaz-Andreu, Lucy, Babić, et al., 2005, 4).

While the paradigm shift brought by 'processual archaeology', did not change the theoretical approach towards identity profoundly, it paved the way for its own counter movement, 'new archaeology' and the emergence of 'gender-' (cf. chapter 6.1.1; also, i.a.: Conkey and Spector, 1984) , 'age-' (cf. chapter 6.1.3; also, i.a.: Harrell and Amoss, 1981) and 'class archaeology' (cf. chapter 6.1.4; also, i.a.: Renfrew, 1982). Central to this was an interdisciplinary debate within sociology, anthropology and archaeology starting in the late 70s. During this time, the idea of the passive individual has changed to the idea that a society cannot exist independently from its people (cf. 6.2). This next paradigm shift was led by sociologists such as Bourdieu (1977a), and Giddens (1979) or archaeologists like Hodder (1978). Albeit a movement that is a prime example of an interdisciplinary effort that led to a common attempt towards a more holistic 'identity theory' in the English-speaking humanities, there was a lack of similar attempts in German speaking archaeology as well as in other European archaeological traditions, as for example in the Balkans (Gavranoivic, 2018; Gimatzidis, 2018; Popa, 2018).

German speaking archaeology is historically still haunted by their predecessors 'culture historical' research history, as with the aforementioned Gustav Kossinna (1936) and his nationalist-fascist theories about the origins of the Germanic people. Therefore, the attempts of engaging into 'identity theory' post WW2, were more often focused on the outright avoidance of a theoretical debate, and instead focused solely on the material itself. In the slipstream of this theoretical head in the sand tactic and without the proper interdisciplinary theoretical debate, ever so often old ethnic terms were still negligently used and applied to define archaeological groups.

More modern efforts of adapting 'identity theory' in the wake of 'new archaeology', particularly in historical archaeology, began only in recent centuries and focused primarily on the possibilities and limitations of identifying the material culture that shaped social groups (cf. Brather, 2000).

Unfortunately, the mere mention of both, 'archaeology of identity' and traditional equalisation of archaeological and historical groups, has led habitually to an inner archaeological and scientific conflict, frequently entailed by contemporary political issues (cf. Bierbrauer, 2004, 74-75). In some ways, this reflects a conflict between traditional ethnic interpretations of 'cultural historical archaeology' traditions and the more recent anglophile, interdisciplinary 'post post-processual' traditions.

An excellent example of such a conflict is the public argument between Sebastian Brather (2000) and Volker Bierbrauer (2004). The dispute stemmed from Brather's fundamental criticism of ethnic identification in the early medieval archaeological records and the allegation that German Early Medieval archaeology has not changed its nationalist narratives post 1945. As described above, he accused them of retreating to a supposedly neutral, purely material based, antiquarian style of archaeology. Moreover, he also criticized that, while racially loaded vocabulary seemed to have disappeared, the term '*Volk'* was in his opinion simply substituted by '*Archäologischer Kultur*' (Brather, 2000, 164). Brather's methodologically sound but also aggressive study led to the subsequent refutation by Volker Bierbrauer, who accused Brather himself of focusing solely on theory, disregarding the archaeological record and politicization. While Biebrauer's argument, that Brather ignored the archaeological record, was not completely wrong (cf. Siegmund, 2006, 225-226), it was also Brather`s attempt to remind German colleagues in Early Medieval archaeology, that ethnic identity is just one aspect of complex group identities, and that in contrast to some of his contemporary archaeologists: "sociological and historical research emphasises the flexible, situational character of 'identities'" (Brather, 2000, 176).

Openly fought out arguments like this are not only necessary and inevitable, but also essential for transformations within theoretical research history. Sadly, as the Brather-Bierbrauer conflict shows, such arguments, often lose their original incentive and end up being about the conflict itself. Nevertheless, German speaking archaeological theory has come a long way. In the wake of scientific globalisation, young archaeologists have an abundance of theoretical foundation available. New identity studies are published regularly, focusing on specific group identities like gender (cf. i.a. Sørensen, 2000; Rebay-Salisbury, 2016b; Ramsl, 2020a), age and lifecycle (Siegmund, 2006; Nakoinz and Knitter, 2016; Popa, 2018) or critically renewed assessment of race and ethnicity in the wake of aDNA (cf. i.a. Hakenbeck, 2007; Fernández-Götz, 2013; Heyd, 2017). Many of these studies, which exemplify this change, originate from, or are associated with the German-speaking archaeological area. Part of this shift is a use of holistic methods, either by incorporating archaeology with modern scientific methods like isotope analysis (Scheeres, 2014; Knipper, Pichler, Brönnimann, et al., 2018) and quantitative methods (Siegmund, 2006; Nakoinz and Knitter, 2016; Popa, 2018) or by a combination of sociology and history (Fernández-Götz, 2014).

3.2.3 Identity Theory in Other Contemporary Human Sciences

It is debatable, how much the inclusion of the hypercomplex and diverse discourses of the contemporary human sciences will add to the understanding of group identities of pre and proto historic societies, specifically concerning modern identity issues. However, since there are numerous ways of affiliations presented in a non-material way, archaeology has its natural limitations in identifying group identities. Several aspects necessary to understand group or individual identity, e.g., its multi-layered nature, how it formats, changes and can lead to identity crises, or how it is expressed in everyday life are aspects archaeologist can derive from other scientific fields. Many of the models, theories and the research history that led to their establishment will be outlined in the following subchapters. It is also important to note, that this section is only a brief outline. Additionally, two of the essential theories for this thesis, namely Bourdieu's (1977b) 'habitus' and Henri Tajfel's (1970) 'in-group bias', are derived from sociology and psychology and are only addressed briefly within these sections. I will elaborate more on both concepts in their specific sub chapters later on (8.3 and 10.2.1).

3.2.3.1 Psychoanalysis and Psychology

In psychology the concept of identity was widely discussed by various psychoanalysts, and psychologists, as Freud (1923), Adler, Ansbacher and Ansbacher (1956), Marcia (1966) or Côté and Levine (2002). Most essential for this thesis are two influential frameworks within two different schools of thought. First, in the field of social psychology, Henri Tajfel (1978) proposed 'social identity theory', which focuses on an individual's sense of who an individual is, based on their social relationships (cf. Stets and Burke, 2000). Being part of a group gives us a sense of belonging, which itself is a source of self-esteem and pride. Additionally, via a process of social categorisation (Turner, 1987) we divide our society into social groups, that often are perceived as 'us' and 'them'. Tajfel considered this process of establishing stereotypes as a basic cognitive process, which highlights communalities with once own group and differences with other groups. This concept is known as 'in-group (us) and out-group (them) bias' and is a quintessential aspect of the 'similarity algorithm' applied for this thesis (cf. chapter 10.2; also cf. Tajfel and Turner, 1979; Tajfel, 1982; Popa, 2018, 56).

The second essential concept reminds us that an individual identity formation is never determined, other than by his or her experiences. Most essential for this notion, are theories by the developmental psychologist and psychoanalyst Erik Erikson (1968b). His models are concerned in how life changing events, will inevitably lead to the possibility of identity crises. How we act in these crises will cause a transformation of our present identity. Either 'positively' through awareness, adaptability, and the acceptance of possible new realities, or 'negatively' via denial, unawareness, or deliberate ignorance. Leaving mental health implications aside, both identity diffusion and the preservation of a plausible identity will shape our sense of identity. Erikson describes the formation of individual identity, its

necessary conditions, and the prevention of identity crisis. One's own life orientation is continuously determined by constantly recurring identity formation processes. Ideally, as defined by Erikson and his collaborator and wife Joan Erikson (1997) within their theory of 'stages of psychosocial development', most crucial stages in our quest for an individual identity take place in our adolescent years. We fight and overcome emerging identity crises throughout our lives, to end up as adults with a balanced and stable identity.

As acknowledged by both Erikson's, this ideal development is not always realistic and the formation and crises of our identity accompany us far beyond our adolescence (Krappmann, 2000; Davidovic, 2006, 41). Erikson (1968a) considered the experiences, caused by identity crises central to the formation of our identity. These crises can be triggered by individual trauma, crucial life changes or times of social transformation, by marginalization and migration processes or other social alterations, such as becoming unemployed or losing faith in your religion or ideology. The objective is to overcome those crises and achieve a stable identity. Through constant adaptation and awareness, you control and balance your own identity formation, therefore prevent a permanent identity diffusion. Only acceptance of contradictions and ambiguities, as well as adaptation of your perception of continuity and coherence throughout times of change, allows for a sense of plausibility of your identity (Straub, 1998, 75; Burmeister, 2006,10; Davidovic, 2006, 41). While these dynamics were originally focusing on individuals and their life cycles, modern studies apply and revaluate concepts of 'identity crises' and consequent reformation processes on groups such as emerging academic fields (cf. Gioia, Patvardhan, Hamilton, et al., 2013; Patvardhan, Gioia and Hamilton, 2014). By following this argumentation, implications emerge, as such dynamics in theory should also apply to any pre- and protohistoric groups, such as those individuals buried in the Traisen Valley.

3.2.3.2 Sociology and Social Philosophy

Research on 'identity theory' in the social sciences focuses on the framework and the conditions of the formation and preservation of group identities. Thereby, identity was primarily, up until about 30 years ago, and partially still to this day, regarded as an aspect of normative integration of an individual in social groups and their identities (Wagner, 1999, 48; Davidovic, 2006, 42). Furthermore, Wagner (1999, 47) described three general debates within the social sciences regarding identity, each combining the concept with a different notion. One debate relates to culture and its bearing on group or individual identities, another to modernity and its consequences on identity and finally differentiation and discrimination in-between identities. While these debates overlap with each other, they ask different questions. Before these debates are considered, it should be stated that Pierre Bourdieu's (1977b) sociological concepts of 'habitus' and 'capital', due to their impact on this thesis, will be elaborated on their own chapter 8.3.

For the most part, social sciences did not grant individuals any agency in their own identity. It is important to mention though, that when researching the history of sociology and social philosophy, similarly to archaeology and running in parallel, three phases, which were defined by respective paradigm shifts in the 1960/70s and the 1980s, can be identified. (Davidovic, 2006, 42). Until the early 20th century, identity was considered as pre-determined. While it had been acknowledged, that a society consisted of layers of different social classes, the individual, embedded in a system of inequalities in which he/she had no choice (Wagner, 1999, 53; Davidovic, 2006, 42-43). If you were born in 1760 England as a son of catholic cobbler, your identity was supposedly pre-determined. In reality however things were not so set in stone. This unnamed individual could very well emigrate to one of the 13 colonies of the New World, start a new life as an innkeeper, join various Christian subsects, and by 1776 be officially considered an American, and not an Englishman.

Only in the late 60s, with the establishment of 'symbolic interactionism' by Herbert Blumer (1986) and further work by his teachers Mead and Morris (1975), Goffman (1967) or Strauss (1974), human agency and individuality was not only recognized, but also emphasized individuals as wilful, active actors. The only determined factor is interaction, meaning to fully understand the individual or social groups, it is necessary to understand their various interactions with both the surrounding physical structure (biosphere, hydrosphere, lithosphere, and atmosphere) and social factors (economic -, social – political, and historical sphere).

In addition, the concepts of 'symbolization' and 'emergence' bring further unpredictability. 'Symbolization' focuses on meaningful events, persons, objects, environmental features becoming loaded with specific meanings and thus human behaviour can subsequently and suddenly change. 'Emergence' highlights on the processual and unfamiliar aspects of a society, therefore the constant possibilities of transformation and the emergence of new social systems (Reynolds and Herman-Kinney, 2003). Familiar themes that were introduced to archaeology by 'post processual archaeology' (cf. Hodder, 1982; Lincoln, Boxshall and Clark, 1983; Hodder and Hutson, 2003). In other words, an individual identity is formed through interactions with various group identities, institutions, other individuals and symbolized events, objects etc. Thus, to a certain extend an individual can choose deliberately their own set of identities out of the existing set of offered identities, while other aspects emerge partially unconscious. This extend is further defined by the existing pluralistic identity models that are featured in the society we exist in.

The main focus in identity research shifted from deterministic models to an identity concept based on processes of interaction and communication (i.a. Habermas, 1976; Döbert, 1980). From the 1980s on the idea of 'postmodern identity' was established (i.a. Lash, 1992; Kellner, 1995). Our postmodern hypercomplex reality, working environment, media consumption and the possibility to travel or

communicate all around the globe add layers of overlapping constant changing identities that reinforce instability but also diversity (Hansen, 2007). The safety and sense of continuity and coherence that prevent us from identity crises are thus spatially and temporally limited (Kaschuba, 1999, 139).

Yet, our diversity in possible identity concepts is often regarded as a modern phenomenon. The Swiss psychologist, social and cultural scientist Jürgen Straub (1998), considers the experiences of diffusion, divergence or the loss of coherence as an identity forming processes to be a purely modern phenomenon. He perceives modern reality as space of constant, dynamic uncertainty, thus our identity if defined by self-reflection and self-critique directed by doubt. While he does acknowledge that periods of uncertainty and disconnection are and always have been the basis of human existence, he argues that those periods only became a constant companion of our everyday life in modernity (Straub, 1998, 88).

Whether his assumption is an over romanticization of the assumed stability and predictability of traditional previous cultures or an overemphasis of our current complexity is open to debate. While there are several historical periods of change and turmoil that may contradict his assumption, e.g., every act of imperialism or colonization in human history, it is notable that modernity does amplify the symptoms. Straub is not alone in his argument, as the scientific debate regarding 'identity theory' in social sciences often exhibits a pessimistic view on our modern times. It is described as an era of scepticism, doubt, and denial towards established narratives and conservatism in its literal sense. It is this perceived turmoil, that e.g. Giddens (1991) considers as the catalyst for the modern need and necessity of identity construction. Triggered originally by the tumultuous times of industrialisation, the emergence of socialism and liberalism and urbanisation in general lead to a general perception of disembedding (Giddens, 1995). Stances like those of Giddens and Straub are established but also critically reviewed today. Identity crises and constructions are viewed as a universal phenomenon yet changed and amplified in modernity. Still, to this day social sciences almost exclusively focus on the present (Davidovic, 2006, 43).

3.2.3.3 Ethnology

Lastly, in ethnology identity represents one of the base concepts of ethnological theory, as the unity of a social group is built upon their sense of similarity, therefore group identity. For ethnologist like Klaus E. Müller (1987, 85), this sense of acceptance or assumption of sameness is primarily based on ethnicity, or even more simplified, kinship and a common language (cf. for ethnicity 6.1.2). Through group identities, an individual can achieve orientation in social as well as spatial spheres. Thus, the focus of 'identity theory' in ethnology lay in its formative characteristics, specifically for cultural and ethnic groups (Müller, 1987, 10).

Generally, ethnology, as well as its modern variation cultural anthropology, follows the developments of the social sciences. Out of the resilience against earlier deterministic views of the like of Mead (1928) or Benedict (1934), new termini as 'hybrid identity' or 'multiple identities' emerged to acknowledge the multidimensional aspects of individual and group identities. This established that identity consist of multiple layers of identity concepts. Depending on the group identities that are offered by the society an individual exists in, a hybrid identity, or an amalgam of all possible identities emerges. (Bhabha, 1994; Baumann, 1999; Hall and Mehlem, 2000). Similarly as described by Hansen (2007) or Crenshaw (1989) various layers of identity are not on par, rather dependent on various aspects, especially the stages of one's own life along with endogenic and exogenic occurrences surrounding one self. These concepts, especially the notion that an individual's identity is comprised of various distinct overlapping group identities, his or her society provides, is not only quintessential to comprehend the concept of identity itself but also for understanding and properly interpretating the final clusters obtained by this thesis method. Thus, to its importance, this concept along with a description of group identities themselves will be worked out in more detail in chapter 6.

As stated at the beginning, this holistic composition of identity concepts within the human sciences never attempted to be complete. For instance, some other academic fields as media (e.g. Potter, 2012) and communication (e.g. McGlone and Pfiesrer, 2009) studies have their own specific focus on identity concepts that have been avoided for this thesis as they focus almost entirely on postmodern or modern aspects of identity. The original idea of this section was to entangle the often-addressed blurriness of the term as well as to comprehend identity concepts outside of the standard archaeological set of theories, that are potentially relevant for understanding and proper interpretation of data and result.

4 Group Identities and their Intersecting Nature

Our individual identity, as anticipated in several previous chapters, consists of many layers of group identity categories that are, intentional or unintentional, provided by the society we live in and are constantly shifting and interloping with each other (cf. ia.: Díaz-Andreu, Lucy, Babić, et al., 2005; Davidovic, 2006, 44). All individuals find themselves in a variation of these simplified group categories, such as class, gender, ethnicity, age, or religion and ideology. All of us have a gender, relate to an age group, or loosely stem to one or many ethnic categories, networks, or communities, whereas a social hierarchy or a religious sphere at least can be assumed in most societies from a certain point in time. Participation in group identities can be involuntary by birth, as with your family, ethnicity, nationality, gender, or generation.

Despite this, almost all of these group identities can be transformed, as with religious conversion or the change of an assigned sex. Other associations occur by choice, either by a common interest, like a

political affiliation with a party, participation in a group with a common practice or interest like artistic circles or sport clubs and some even forcefully as with conscription into a military force (cf. Assmann, 2006). It is important to note, that involuntary group identity participation by birth is not identical with being born with a certain identity or affiliation to a group identity, as identities, besides aspects of age, are not biological determined. For instance, while sex is a biological concept, gender identity is not (Oakley, 1972). Group identities are also non-static, as they format and change, both through the experiences and crises in our never-ending psychological development, and normative interpretations of reality by the social groups we exist in (Erikson, 1968b; Díaz-Andreu, Lucy, Babić, et al., 2005; Fernández-Götz, 2014). These interpretations are defined in categories: gender, age, religion, class, ethnicity and various subcategories like ideology, family, occupation, corps spirit and so on (cf. 6.1.1 - 6.1.6).

For the most part, we are only able to choose identity categories that are available in our society, but technically we have agency over which category we emphasis most at a certain time (Hansen, 2007). Therefore, as Manuel Fernández-Götz (2014, 13) put it; "the various identity categories that appear superimposed and cointegrated (gender, age, ethnicity, status, etc.) fundamentally determine the way in which people, both individually and collectively, perceive the world and conduct themselves in it." Understanding these intersections of group identity is critical for understanding how cultures institutionalise some of these identity groups. As common group identities format, a harmonization of personal and common interest must be achieved in relation to comprehending the identity of each part in correlation to the others. Depending on their simultaneous functionality and level of universality there is also a vertical hierarchy of group identities. More universal or general group identities cannot be easily questioned by less general identities, as hegemonial group identities also cannot prevent the formation of marginalised identities entirely, thus creating a balancing systematic that allows group identities as local, regional, ethnic, religious, class, etc. to exists simultaneously as well as complimentary (Jovanović, 2005, 77; Popa, 2018, 55).

All this correlates to a complex system of constant intersecting group identities, pre-set by the structure but personally emphasised by the individual agent, as well as 'in- and out-group' dynamics (cf. 10.2.1) that function as a synergy of both. One way to understand this is the 'concept of intersectionality' (Davis, 2008; Hill Collins and Bilge, 2016). As briefly stated before, this concept was first coined by the law professor and philosopher Kimberlé Crenshaw (1989), and was originally intended to illustrate how hybrid identities correlate to systematic oppression and discrimination. Since then Intersectionality had been praised as one of the most significant contributions to women's studies and has been used in various and vast amounts of scientific fields of the humanities (Davis, 2008, 68). 'Intersectionality' is therefore a means to understand the complexity and correlating nature

of group identities, institutional provisions, social practices and how this constant interaction is manifested in power and material culture.

4.1.1 Gender Identity

Gender as an identity concept, stemmed its origin out of feminist theory, specifically psychoanalysis (Stoller, 1968; Oakley, 1972). Ann Oakley (1972) was one of the first to address the distinction between gender and sex. This paradigm shift challenged the old biological determinism that differences and inequalities in between sexes are based on natural differences and from there on spread to other fields of the humanities, as sociology (Rubin, 1975), by way of English speaking and Scandinavian traditions into archaeology (e.g.: Conkey and Spector, 1984) and finally our everyday lives (Sørensen, 2000; Díaz-Andreu, 2005; Fernández-Götz, 2014, 24; Ramsl, 2020a, 12). Whereas Sex is solely defined by biological, physical or genetical traits, gender is conceived and characterized by social dynamics and transformation. It is an essential factor of individual as well as group identity formation processes and a mean for self-identification and identification of others. Even though it is to a degree bound to social constraints, individuals do have agency (cf. 6.2). While it is essential that Gender and Sex are not identical, it is conversely important to acknowledge that they are related to each other. Foremost in aspects as e.g., sexuality, sexual orientation, or childbirth (Schmidt and Voss, 2000, 2; Díaz-Andreu, 2005, 14; Ramsl, 2020a, 12).

Some forms of sex are not based on the binary biological definition of sex, as with asexuality, hermaphrodites or voluntary or unvoluntary castrates. Other aspects of gender are further not easily categorized on sex, such as homosexuality and all variations of transgender people that can neither satisfactorily be labelled by sex or gender (Fernández-Götz, 2014, 24; Forsyth and Copes, 2014, 740). It must be stressed that the strict binary concept of gender defined mostly by Abrahamic religions and western culture, should not be applied to other cultures. It has become consensus in modern social sciences that in theory there is no limitations of gender in human groups as gender definitions are not universal. Gender is rather a subjective, socially constructed identity that is important to a particular group of people's understanding of their social structure. A third gender e.g., is a concept that can be found in various anthropological and historical contexts. Examples incorporate the well documented and often cited 'Two-Spirits' or *berdache* among various North American native communities (Forgey, 1975; Hollimon, 2001; Díaz-Andreu, 2005, 15-17), eunuchs in various cultures as the Byzantine Empire and various Chinese dynasties (Tsai, 1996; Tougher, 2008; Kutcher, 2018), the '*bacha posh'* of modern Pakistan and Afghanistan (Nordberg, 2015), the 'sworn virgins' of Albania (Littlewood and Young, 2005) or the '*hirjas'* of India (Suthrell, 2004).

While some of these instances of a third gender are forced, as in most circumstances eunuchs, the majority are opportunities for either both biological men or women to live as their opposite gender or

a third gender. In any case, these changes always incorporated an institutionalised and publicly acknowledged shift in status and class. As with most facets of identity, these and other multidimensional facets of gender and sex must be recognized. One distinct example is the interdependency of age and gender. Depending on a society's social norms, gender is perceived vastly different depending on which life stage an individual is. Within this the transition from one age group to another and the related rituals are essential, as they often redefine or transform the perception of gender and individually within a group (Díaz-Andreu, 2005, 15; Fernández-Götz, 2014, 23). In an explanatory study by Harriet Whitehead (1981) among the North American Blackfood Confederacy, she observed that only when women arrived at a certain stage of their live and lost their fertility, they are granted to adapt a gender that is more similar to a male definition. This is something archaeologist or anybody who assesses gender roles of past societies must be aware of, as gender roles are never static and always intersect with other group identities, specifically age, class, and ethnicity.

4.1.1.1 Gender Archaeology and the Issue of the Archaeological Gender

Gender Archaeology is both the pioneer as well as the most frequently researched aspect of archaeological identity studies. Gender Archaeology aims to achieve four goals. First and foremost, to demonstrate past and present gender imbalances in the archaeological profession. Although this is in essence an inequality issue, it did lead to the remaining objectives that are all concert with challenging contemporary and traditional outdated gender preconceptions. Doing this, directly affects our interpretations of past societies, as well as the assumed universality of gender roles, characterisations, and values. This is well portrayed by the second objective, to redress gender disparity by focusing on woman's productivity and demonstrating that these were as much vital as those by men (Díaz-Andreu, 2005, 32-34). This was well presented by Joan Gero (1991, 176) when she addressed in relation to Neolithic and Palaeolithic gender archaeology that "there are no compelling biological, historical, sociological ethnographic, ethnohistorical, or experimental reasons why women could not have made – and good reason to think they probably did make – all kinds of stone tools, in all kinds of lithic materials, for a variety of uses and contexts."

The remaining two objectives are concerned with the issue, that for a long while, many archaeologist interpretations suffered from three biases: androcentrism, biological essentialism and gender polarisation. These interpretation stem from the issue that male superiority in social organisations and human development was largely seen as a universal fact up until the 1970s. Only at that time, feminist scholars like Ann Oakley (1972) were able to question this paradigm. Many past male archaeologist and anthropologist derived the assumed social inferiority of women as a historical and biological fact. In many cases based on their own personal subjective bias against women (Díaz-Andreu, 2005, 17-19).

One notable example for both anthropocentric interpretation and determined gender roles would be Konrad Spindler (1983, 108) and his interpretation of the exceptionally rich female La Tène burial also known as the 'Lady of Vix'. Even though anthropological inquiries determined the skeleton as female, at that time it still deemed somewhat inconceivable for Spindler that this could be a female burial. Hence farfetched interpretations such as a transvestite male priest or an honorary male burial were suggested rather than a powerful female (Spindler, 1983, 108; Arnold, 1991, 370). It is notable that the 'Lady of Vix' is far from an isolated phenomenon. Although it is still arguable that Central European iron age societies were probably male dominated, similar examples in the archaeological record of women that seem to hold significant power can be found in both Hallstatt (e.g. Bettelbühl, Schöckingen) and La Tène (e.g. Reinheim, Waldalgesheim) period as well as in historical records as with the famous Iceni chief Boudica (Gardela, 2013; Hedenstierna-Jonson, Kjellström, Zachrisson, et al., 2017). Another similar example would be the famous Viking Age chamber grave 'Bj 581' from Birka. Originally excavated in 1889, it was considered a prime example of a male Norse warrior. Only after several anthropological re-examinations (1970 and 2014), a controversial debate and finally a conclusive DNA analysis in 2017 it was accepted that 'BJ 581' was indeed a female warrior. This very public conclusion did not only challenge the androcentric interpretation and preceding debate, but also generally the role of women in Viking culture (Gardela, 2013; Hedenstierna-Jonson, Kjellström, Zachrisson, et al., 2017).

4.1.1.2 Male Identities Beyond Determinisms

A science-based gender archaeology naturally should incorporate male identities as much as female, and all possible identities in between. Besides the essential exception of any gender imbalances or discrimination within archaeology as a field, any gender based study also should ideally be free of any ideological research biases (cf. 4.2.3 for bias in science; also: May, 2021). Yet studies on male identity seemingly often fall into an ideological trap, leading to reasonings that are either argued from a predominantly feministic point of view, or those that aim to 'protect' and reinforce traditional concepts of masculinity (cf. Knapp, 1998a; 1998b). In the end, male identity is just as varied as female identity, even more so as a component of a hybrid identity. However, it cannot be denied that the interplay of male identity, masculinity, and power, forms a significant portion of this variety.

Pierre Bourdieu (1997, 44-45; also cf. 8.3 for further detail on 'habitus' and related concepts) defined this aspect as 'masculine habitus', that is itself part of the 'sexual habitus'. In essence, the 'masculine habitus' illustrates a socially constructed impetus for domination over both, other men, and women. This need for domination is enacted in everyday practices, such as language, behaviour, gesture, or clothing. Although it could be argued that Bourdieu generally attempted to avoid the extreme polar opposites of structuralism and individual choice (cf. 6.2), some scholars, such as the sociologist Raewyn Connell (2014, 13-14), consider Bourdieu's 'masculine' and 'sexual habitus' to be overly structuralist.

Connell herself emphasised agency as an additional and essential factor for what she defines as 'hegemonic masculinity'. She therefore differentiated in between 'hegemonic masculinity', 'subordinate masculinity', 'complicit masculinity', and 'marginalized masculinity' (Connell, Meuser and Müller, 2014, 129-135; Ramsl, 2020a, 16). Importantly though, she also underlined that these and similar power dynamics are constantly shifting as they intersect with one another and with other group identities, such as ethnicity or class (Connell, Meuser and Müller, 2014, 134-135). Substantiating again that gender identity in general, despite its historical correlation with dominance and repression, is always part of a hybrid identity, in some cases, even superimposed by other group identities, particularly class (cf. Hedenstierna-Jonson, Kjellström, Zachrisson, et al., 2017)

It is interesting that despite the regular inclusion of concepts as 'Hybrid Identities' and 'Intersectionality', many modern archaeological studies that deal with male identity, still focus on traditional features of masculinity (cf. Treherne, 1995) or primarily employ it as a contrast or comparison to female identity (cf. Arnold, 2016). Research that focuses on male identity as an intersecting amalgam of diverse identities, however, are still rare. One such study done by Ramsl (2020a) focused on Early Iron Age burials from Slovakia, Moravia and Upper Austria, also including this thesis research area and cemeteries. This interdisciplinary research project combined archaeological data, 'identity theory', anthropological inquiries as well as DNA analysis, and highlighted, that male burials diversified far beyond weapon carriers. Particular significant was the differences of male burials in between age and class groups, such as e.g., a considerable number of unarmed elderly male burials with precious metal adornments such as fingerings, along with a number of other variations, such as male burials with female adornment combinations, female weapons burials (cf. 14.3.3), along with identities of occupation (cf. 6.1.6) and more ambiguous identity representations, male and female alike (Ramsl, 2020a, 171-172).

4.1.2 Ethnic Identity

Even more so than gender issues, ethnic identities remain a continuous source of social strife and political abuse. Over the last 30 years alone, conflicts classified as 'ethnic' such as the Yugoslav Wars (Baker, 2015; Hanson-Green, 2020), the Rwandan genocide (Rwanda, 1998; Guichaoua, 2021), the ethno-nationalist conflict in Northern Ireland (Bew and Gillespie, 1993), the ongoing Kurdish-Turkish conflict (Beriker-Atiyas, 1997), or the recent Rohingya genocide (Human Rights Watch, 2020) dominated their respective news cycles, only to name the most prominent contemporary historical events. Some of these such as the Rwandan genocide rank among the deadliest conflicts post World War 2 (Guichaoua, 2021). Despite this historical overdetermination, ethnic identities are not considered to be constant entities by present day humanities, but as facilitated subjective beliefs, enacted by groups that share common features such as similar physical traits, a common language, or

collective memories. These facilitated group identities remain among the most politicized group identity formation processes (Schreg, Zerres, Pantermehl, et al., 2013, 101; Weber, 2013, 389; Popa, 2018, 53). In the light of this and the ongoing nationalistic misuse of archaeological evidence by some modern governments, it is no surprise that the traditional concept of ethnicity in archaeology, and human sciences in general, remains criticized and scientifically challenged to this day (Collis, 2003; Gavranoivic, 2018; Gimatzidis, 2018; Popa, 2018).

As touched upon when 'identity theory' in Archaeology was introduced (cf. 5.2.2), this traditional interpretation was characterized in archaeology by Kossinna (1920) and Childe (1927) and formulated, as Cătălin Popa (2018, 53) put it,: "… that archaeological cultures corresponded to ethnically distinct groups of people, leading to the image of a prehistoric landscape populated by monolithic cultural entities that gradually evolved in time." The consequential racist and fascist manipulation of archaeology by Nazi Germany is rightfully cited as the primary reason why the topic of ethnicity in archaeology for the most part of the latter half the 20th century either was heavily questioned or ignored (Brather, 2000; Härke, 2000; Trigger, 2006; Legendre, Olivier, Schnitzler, et al., 2007). As with Gender Identity the inner archaeological questioning of these traditional conventionalisation, stemmed from a wider discourse within anthropology, sociology, and other social sciences. Especially within the emergence of post-processual archaeology, archaeologists were able to use new perspectives from within the social sciences to challenge and redefine ethnic identity in the past, as an undetermined, fluid, and subjective construction (Lucy, 2005b, 94; Fernández-Götz, 2014, 18).

One of the first seminal collection that suggested that ethnicity is not a biological determinism but rather a common notion established and constantly re-established by communities was published by Frederik Barth (1969, 9-10) in 'Ethic Groups and Boundaries'. Barth and his fellow contributors focused not on differences in between ethnic groups but explored which processes and dynamics ethnic identities are generated and maintained, whereas previous studies maintained the idea that ethnic groups were separated by static natural boundaries. The collective fieldwork and studies established that these ethnic boundaries and partly conscious isolation, while essential for the existence of ethnic identity, still are simultaneously and constantly crossed through trade or intermarrying. Ensued by this isolation, ethnic characteristics, as language barriers, racial animosities, or cultural differences, only format and further are sustainable by maintaining this isolation (Barth, 1969, 11; Lucy, 2005b, 94).

In the contribution of Gunnar Haaland (1969) concerning boundary maintenance between the Fur and Baggara, two ethnic communities in Western Sudan, he exhibited that although preservation of these ethnic borders were integral, economic factors led to intergroup marriage as well as recruitment and further to a nomadization of families and individuals of the Fur to replenish the Baggara. This example not only demonstrated the organising and balancing effects of intergroup relations but also the integral

role of individual actions as sources of ethnic identity change and balance. Barth, Haaland as well as other researchers utilized ethnoarchaeological, sociological and anthropological views to attempt a redefinition of ethnicity, away from a determined, static group identity construct, towards a fluid, situational and subjective definition. Following these Ethnoarchaeological and Sociological paradigm shifts, archaeological research in regards to ethnicity became further influenced by the debate between postmodernism and instrumentalism, specifically 'theory of practice' by Bourdieu (1977a; also cf. 8.3) as well as de Certeau (1984) or Giddens (1984) equally impacted the paradigm shift in how we understand ethnicity today.

When debating ethnicity in an archaeological context there are specific methodological and theoretical aspects that must always be considered. It is important firstly to always keep the cumulative nature of group identities in mind. Ethnic identity is always part of the individually perceived amalgamation of intersecting hybrid identities and therefore should not be separated from other group identities as age, gender or class, as wells as from social dynamic as power or hierarchy (Díaz-Andreu, Lucy, Babić, et al., 2005). Secondly that ethnicity is a matter of degree. From one ethnic group to another, as well as between individuals within an ethnic community. One group might be very deliberate and conscious in their ethnic identity and purposefully demonstrates their distinctiveness to other groups. A different group may not attach any specific significance to their ethnic belonging, at least in a way that materializes itself in the archaeological record. Similarly, even in a group with a keen sense of ethnic identity one or many individuals, may not share a similar need for presentation. On the other hand, if a small elite group that places an importance on their ethnic identity and consequently sets a fashion standard based on ethnic markers, these fashion standards can be adapted by the rest of this group, even if the ethnic character of their costume, compared to other aspects as practicality or hierarchical and power dynamics, is only of minor relevance for a considerable part of said group (Renfrew, 1987, 217; Brather, 2004, 112-113; Fernández-Götz, 2014, 19; Eriksen, 2015, 268-269).

All these variables and dynamics are similarly changeable and while ethnicity is not malleable, its flexibility depending on the contextual reality is always present (Lucy, 2005b, 96). A pragmatic example for such social and ethnic flexibility in late antiquity is handed down by the Eastern Roman historian and diplomat Priscus of Panium in his fragment 11. Here he tells the story of two unnamed Romans that became prisoners of the Huns. One of them forcefully became a warrior and fought battles side by side with his new Hun lord. Two years later, when Priscus met him again, this Roman had become indistinguishable in costume and habit from a Hun warrior. In the same fragment the diplomat Priscus tells us from a debate he had with a former Greek trader that lived among then Huns now as a Scythian warrior. Here the former trader argues that the life of a free, armed warrior nomad, enjoys equal rights and is much safer compared to the life of a roman civilian as long as he is competent in war and stays loyal to his lord (Steinacher, 2009, 274). This anecdote is, for one, an obvious juxtaposition between

an unrestricted, militaristic barbaric lifestyle and a repressed, civil Roman one. Nevertheless, it also demonstrates the pragmatism and adaptability of ethnic and class identity, as well as the intersectionality of these identities, despite being situated in a very particular and turbulent time and place.

4.1.2.1 Redefining Ethnic Identity and what a 'Celt' is

All these considerations led to a broad consensus that ethnicity, as well as the supposed membership to an ethnic group, is primarily an instrument for self-identification and self-recognition, based on inherited aspects as common kinship language or history, consciously established by a social group (Shennan, 1989, 14; Hall, 2002, 9; Fernández-Götz, 2014, 18). Consequent definitions, or redefinitions, added further dimensions to the debate, as with the approach offered by the sociologist Anthony D. Smith (2008). He distinguishes ethnicity into two aspects of practice. One narrow usage that concentrates on fundamental aspects, like a common descent, and a broader one that he defined into three classifications: 'ethnic categories', 'ethnic networks', and 'ethnic communities'. 'Ethnic categories' are mostly exogenous labels, to define groups of people with perceived shared aspects of common culture or that live mutually in a certain territory but lack any self-definition or solidarity by themselves. An 'ethnic network', defines larger groups that often share a collective name or a mythological ancestry, do have patterns of loose cooperation and solidarity, at least among the elites, but most often don't have a political unity. Lastly, 'ethnic communities', which defines groups that are solely named and defined by themselves and correspond to the definition of ethnicity presented in the first sentence of this paragraph.

Another definition for ethnic identity, which particularly emphasized its inherent dynamics, came from Siân Jones (1997, 13) and incorporates aspects of 'in-group bias' and 'intergroup conflict' (cf. 10.2.1; also: Tajfel and Turner, 1979). Jones outlines, that an individual's self-conceptualization is not only motivated by a sense of communality with one group, but also in opposition to another. More specifically, she concludes that; "The concept of ethnicity focuses on the ways in which social and cultural processes intersect with one another in the identification of, and interaction between, ethnic groups". This 'we and the others' concept, while essential for all group identity formations, seem to be especially fundamental in regard to ethnic identity. Yet, it is important to understand that while opposition to others is essential for ethnic identity formations, these processes are defined by the interaction of both self-identification and outside categorization. Thus, while ethnic communities ultimately define themselves, their self-definition is influenced to various degrees by outside groups (Renfrew, 1987, 217; Brather, 2004, 112-113; Fernández-Götz, 2014, 19; Eriksen, 2015, 268-269).

This is best exemplified in colonial contexts, both antique and historical. A prime example is the ethnic definitions of Hutu, Tutsi, and Twa, that was seminal for the Rwandan genocide. Prior to both German

and Belgium colonial rule, these terms referred to individuals rather than groups, that were distinctly based on linage not ethnicity. The colonial powers in need of a usable elite, artificially turned those pre-existing terms to 'ethnic categories', which officially were introduced by Belgian authorities in the early 1930s. These 'ethnic categories' were publicly enforced, and every Rwandan citizen had to carry an identity card that stated their ethnicity. Over time these labels were commonly accepted by the Rwandan population and led to a social rift that ultimately led to the Rwandan genocide (Rwanda, 1998).

The issue of 'Celtic ethnicity', as well as the surrounding scientific and public controversy over the usage of the term 'Celt' (cf. Megaw and Megaw, 1996; Collis, 2003; Karl, 2004; Rieckhoff, 2007), serves as a similar, antique, example for the relativity of 'ethnic categories', 'ethnic networks', and 'ethnic communities'. The irritation, regarding the ethnic label 'Celt' starts from the very beginning, as in antique literature six different notations are used, as the earliest Greek sources use *Keltoi (Κελτοί*), *Keltai (Κελτοί)* or *Galatai (Γαλάται*) and Roman sources used *Celti*, *Celtae* or *Gali*. While it must be noted that Romans and Greeks seem to convey a somewhat uniform group, with a common language and specific cultural traits, they often used the term misleading. Further can we neither assume, nor fully deny in certain contexts that 'Celts' used either of the terms as self-designation (Tomaschitz, 1994, 95; Dobesch, 1995; Birkhan, 1997, 32; Collis, 2003, 98-100). However only 3 centuries later, in the years during and after the Gallic conquest by Julius Caesar, a certain self-consciouses 'ethnic network', influenced by centuries of partial roman colonisation and acculturation seemed to be evident (Tomaschitz, 1994, 95; Dobesch, 1995; Birkhan, 1997, 32; Collis, 2003, 98-100; Fernández-Götz, 2014). Additionally, there are antique interpretations of what 'Celts' or ethnicity should be that are varied and contingent on the author's biography, context, and time period. Even the Greek term *ethnos (ἔθνος*) and the Roman *gens* should not be considered as identical concepts to either modern notions or each other (Collis, 2012b, 68; Fernández-Götz, 2014, 48 and 58) [4].

The same is also true for 'Celtic' or 'Gallic' self-definitions, as group identities, as established above, are never stable. Especially in times where in-group favouritism and turmoil are involved (Tajfel and Turner, 1979). It seems plausible that, as Dobesch (1995, 38) suggests, 'Gallic' tribes or military formations that were entangled in the Italian tribal conflicts during the 4th and 3rd century, developed something of the kind as a 'Gallic' ethnic identity, regardless if that identity stemmed from pre-existing 'ethnic communities' and '– networks' or from external 'ethnic categories' they simply adapted. It is important to note that although a homogenous 'Celtic' ethnos that spread violently from Central to

[4] As seen in contemporary critique on late 19th and early 20th Culture Historical interpretation of ethnicity and current debates about ethnicity, even in the last 100 years the definitions of what ethnicity is and what not changed drastically.

most of the remaining Europe is fiction, we cannot deny that ethnic identities were relevant for iron age communities as part of their hybrid identity (Collis, 2003; Rieckhoff, 2007; Fernández-Götz and Zapatero, 2012). What it meant to be Celtic within Iron Age La Tène communities themselves, properly varied massively from relevant to irrelevant or non-existent depending on time, space, and context.

4.1.3 Identity of Age

Age or generational identity are for the most part (cf. Gorman, 2021), less politically charged as gender and ethnicity. It is similarly the only group identity that is in some respects definitely biologically determined, yet simultaneously is a matter of subjective social construction that can vary exceptionally. While it is inevitable that as we get older and go through several stages of biological development, the way a community understands and corresponds to these developments is extremely depended on the cultural context. To better understand this, it must be highlighted that the term 'age' can have at least three different meanings (Lucy, 2005a). First the chronological age, which relates to calendar dates, as the date of birth or death, and only can be established with written sources or epitaphs. Second, the physiological age, a medical construct that corresponds to the physical act of ageing, that can be determined anthropologically, at least today, quite accurate by bone length, the fusion of anatomical parts or teeth eruption. And lastly the social age, as in the subjective social definition of what behaviour, responsibilities or social rank are appropriate for a certain chronological age. This aspect differs greatly, not only regarding different communities or cultures but also can change in periods of cultural or technological change. All three definitions are to an extend socially structured and again inseparable from other group identities, most specifically to gender and status (Arber and Ginn, 1995, 5; Lucy, 2005a, 55; Fernández-Götz, 2014, 28).

In comparison to ethnic, class or even gender identity, archaeology did not put much focus on age as a fundamental aspect of group identities and social organisation in general up until very recently. Much of this newfound attention came in slipstream with gender archaeology, as a result studies were primarily centred aspects that are deeply interwoven with gender related facets as motherhood or childhood (cf. Baxter, 2005; Wileman, 2005; Rebay-Salisbury, Pany-Kucera, Spannagl-Steiner, et al., 2018; Rebay-Salisbury, Dunne, Salisbury, et al., 2021). Before this, age, or rather its varying nature, for the most part was neglected. The bearer of archaeological cultures were adult men, thus similarly as women, children or the elderly were ignored. This consequently led to an ignorance towards the impact age groups, as well as their influence and roles, have on any social community and their material culture (Lucy, 2005a; Fernández-Götz, 2014). Adults were considered the norm. Even the constantly changing act of being adult, which is part of each and everyone's life cycle and therefore an essential identity formatting process (Erikson and Erikson, 1997), had been neglected up until recently.

As Lucy (2005a, 47) emphasized, “there has been virtually no work done on their adulthood as something that affects their everyday practices: it is simply assumed”.

Apart from developmental psychology (cf. i.a.: Erikson, 1968b; Erikson and Erikson, 1997), other human sciences similarly neglected aspects of age identities, at least comparatively for a long time. Anthropology and sociology begun to research on how a group’s reproduction was impacted by constituting age groups in the early 1980s and 1990s (Harrell and Amoss, 1981; James and Prout, 1990; James, Jenks and Prout, 1998), while historians as Barbara Hanawalt (1993) or Shulamith Shahar (1990, 1997), among others, started in the early 1990s to take a closer look on various aspects of age in written accounts. Even more essential research presented the crucial dilemma that our respective contemporary bias about both, childhood and old age are in itself social constructions that influenced not only the perception of how present-day individuals in different age groups should behave but also often lead to the assumption that these expectations were universally applicable to other communities, present and past (Hockey and James, 1993; Pilcher, 1995; Lucy, 2005a).

This misconception is essential to understand the archaeological neglect towards age as a factor of socialisation and group identity. Even though there are country specific and even regional differences to this day [5], present western society sees children as well as the elderly as non-productive members of society. They are seen as a liability, somebody that must be taken care off. Especially in Western society childhood is idealised as a time of happiness, sexual innocence and as a time without responsibility (Lucy, 2005a).

In parallel, children and their actions are marginalized and considered societally irrelevant. Until children are socialised into adulthood they are seen as morally inferior and generally less competent, thus their political and economic dependency seems justified. A phenomenon that can be observed in some media and political backlash as well as in the general debate surrounding Greta Thunbergs largely children and adolescence driven Friday for Future movement (Gorman, 2021). While children seemingly need to achieve their full personhood to be fully accepted in society, the elderly lose their credibility at a certain point. Just after a person starts to need caring, they become socially inferior. This process described by Hockey and James (1993) as ‘infantilisation’ leads to a dependency. As they are taken care of the society assumes, as it does for children, that it knows what is right for them. This system is often seen as a determined status quo. Children as well as the elderly were not seen as an

[5] In regards to regional differences e.g., see the varying legal drinking and smoking ages for youth in Austrian federal states: oestereich.gv.at (2021) These are regulated by the federal states and were only aligned in 2019. Before that date you were able to drink liquor in Vienna, Lower Austria and the Burgenland at the age of 16, while in all other federal states you must have been 18 (Kocina, Schuh and Winroither, 2015).

active and integral aspect of societies. Thus, in their assumed unproductiveness, they seemingly did not manifest in the materiel culture (Lucy, 2005a).

4.1.3.1 The Emergence of an Archaeology of Age and Consequent Issues

As with gender archaeology, this neglect did eventually change. While archaeology of childhood became the pioneer field, an archaeology of age and life cycles in general followed consequently. Many such studies attempted to focus on facets of the physiological and social age thus combining osteo- and bioarchaeological methods with archaeological data (Robb, 2002; Bickle and Fibiger, 2014), ethnoarchaeological (Grove and Lancy, 2015) or sociological research (Tilley, 2017). This new focus also revealed certain methodological problems, specifically regarding osteological methods for determining age. In their study, Falys and Lewis (2011) evaluated adult skeletal age-of-death estimation, that were published in three mayor archaeological and anthropological journals from 2004 to 2009. Here they demonstrated a lack of standardization for age categories or descriptive terminology, a wide range of variability of how chronological and physiological age was defined, or that while guidelines were almost always applied, a majority of publications suggested combinations of different techniques that were deemed unsuitable for a global application. The study emphasized how such methodological discrepancies make comparisons of skeletal samples as much unreliable as some of the resultant age estimations.

Similar inconsistencies towards ageing methods were highlighted by Sam Lucy (2005a, 48-50), when he presented results of the Spitalfields excavations in London (Molleson, Margaret, A., et al., 1993). Here a crypt below a church, dating between the 17th and 18th century, with exceptional bone preservation and still existing name plates on many coffins was inquired. Thanks to these name plates and burial registers, details of many of the excavated individuals such as their age and gender could be attained. This led to an individual assessment, as Osteologist were requested to blindly determine the age and sex of the buried individuals to test ageing and sexing techniques of that time and compare them with the data from the nameplates. While sex was generally evaluated correctly, a systematic under-ageing of older individuals, as well as an over ageing of younger individuals was also revealed (Molleson, Margaret, A., et al., 1993). Lucy (2005a, 50) as well as other similar studies (cf.: Millard and Gowland, 2002) argued that past techniques where insufficient to properly assess age approx. above or below certain thresholds, which consequently leads to distorted profiles of cemetery populations. These methodological problems combined with general issues of bone recovery and preservation, led to commonly false estimations, as cemeteries were mostly under and over aged (Lucy, 2005a, 48-50).

Another additional issue is the common misconception of statistics concerning life expectancy at birth or the average lifespan. Since approximated lifespan expectancies often greatly differ to modern numbers, when comparing Britain in AD 1541 with an average lifespan of 33.75 years and Britain in

1991 with 70.1 years for men and 78.3 for women (Laslett, 1995, 19), it is generally assumed that people in the past died younger. In reality, these statistical discrepancies are rather results from a much higher child mortality, then people commonly dying younger. While a child's chance to reach his or her 10th year in 1541 was ca. 61 per cent, in 1991 this percentage grew up to 99 per cent (Laslett, 1995, 23). Although all these numbers did always depend on many other factors, as urban or rural conditions, wet nursing or standards of hygiene among many more, those who survived this threshold, were likely to reach an age in between 50 and 70 years, some even older (Shahar, 1997; Lucy, 2005a). Interestingly as well as paradoxical such high numbers of infant or child mortality leads to a smaller number of populations that reach adulthood and consequently to a greater proportion of children (Chamberlain, 1997, 249).

Issues like these, as well as the theoretical neglect towards age as a varying subjective social construct and a frequently cited modern bias in interpretations, led to a sense that many past interpretation or studies did not reflect past demographic realities properly. Many more recent studies, however, demonstrated enriching results. As presented above, there are numerous attempts to include these formerly historically excluded groups, and consequently to an understanding that age groups are an essential and necessary piece for understanding past communities. Moreover, since age classes and their importance were often underestimated, we should consider that, as Fernández-Götz (2014, 30-31) argued; "Solidarity amongst members of the same age class could even extend beyond other social parameters such as kinship or status."

4.1.4 Identity of Class, Status, and Power

Projection of wealth and status often seem to be a constant in human history. Even more so when the common pre-set correlation of wealth and power is added. While this statement is a generalisation, it is often the presence of economic surplus that is argued to be the essential factor for the emergence and preservation of social hierarchy and inequality. Within the approximate area of Western and Central Europe, political and social inequality are frequently traced back in between the eras of Early and late Neolithic, when supposedly simply organised societies slowly developed to more complex civilizations with political and economic hierarchies (Risch, 2016; Gronenborn, Strien, van Dick, et al., 2018). Yet even these modern interpretations are partially under scrutiny. In a recent study, Roberto Risch (2018), showed that several affluent Neolithic Mediterranean societies had complex and dynamic economic structures with no clear traceable hierarchical or institutionalised leadership. Even further back in the past archaeological research history, there was the general assumption that it was during the Bronze Age when changes occurred, that in distinction to the Neolithic Era, indicated an observable rise of complex social hierarchies. This assumption was based on the emergence of stratigraphic wealth

distribution in many Bronze Age cemeteries and thus still imply a universal notion that wealth and social hierarchy are inevitably linked (Coles and Harding, 1979, 535; Babić, 2005, 70).

This assumption, although questionable as a generalisation, is certainly understandable as it is a fundamental part of our present reality and modern group identities. Today, in the age of social media, we are confronted on a daily basis with thousands of people that portrait and share their status or 'symbolic- 'and 'economic capital' on various social media platforms, thus portraying their social or class identity. Recent behavioural studies (Yates and Lockley, 2018), that correlate Bourdieu's (1979) forms of 'capital' (cf. 8.3) with social structure and social media, did show that social class, in a wider definition, and 'economic capital' are primary motivators for social media usage, when engaging in the digital world. The study also indicated that especially lower socioeconomic class groups focus on social media as a mean of digital self-presentation. They concluded that digital technologies such as social media became part of the contemporary 'habitus' and similar to material features from the past, do provide markers of class distinction and class identity (Yates and Lockley, 2018, 1312). This side assessment, that social media, as a mean to project status, acts similar as past cultural features did, reinforce the notion that the perceived omnipresence of status and class is by no means a mere modern phenomenon. It is therefore not surprising that class and status dynamics had a mayor appeal for past and present archaeologists.

Particularly, but not exclusively, in the era of culture historical methodology, this interest was often not accompanied by the need to achieve an understanding of this complex and essential issue of human cohabitation. But rather to display status objects and general wealth of past elites and consequently gaining fortune and fame by doing so. Presentation or publication of treasures, hoards or other status symbols was seldom supplemented by studies that determined why these objects or structures were symbols of power and status to begin with. It was just assumed that they were, as power as a consequence of economic wealth was seen as determined fact (Miller and Tilley, 1984; Biehl, Gramsch and Marciniak, 2002; Babić, 2005). As this concept is neither completely wrong nor right, it not only outlasted theoretical paradigm shifts as Processual Archaeology but was strengthened by the introduction of American neo-evolutionary models.

All these thought processes were heavily influenced by post enlightenment philosophy that dealt with issues as power, status, and marginalisation. Unsurprisingly, the evidence and importance of these quintessential human issues transcends the scale of this chapter or thesis considerably. Therefore, only the most essential aspects needed to understand consequent archaeological theory towards the topic and anthropological and neo evolutionary models will be presented in this brief excurse on the theoretical and philosophical basis on class and power. Among these, are the works of Karl Marx, Max

Weber, Louis Althusser, Michel Foucault as well as a brief introduction of Pierre Bourdieu's work, as it is strongly correlated to power and status.

4.1.4.1 Theory of Power and Social Inequality

The emphasis for this brief digression, will ley upon on the duality of either determining economic wealth as the primary factor of human social stratification or seeing it as a part of the complex system that is human social behaviour. This dualism is not only reflected in anthropological and archaeological research history but actually dates back to the middle of the 19th century and the ideas of Karl Marx (1818 – 1883) and Max Weber (1864 – 1920). It can be argued that the consequent over-emphasis on economic wealth or capital can be traced to the historical impact of Karl Marx. His body of work, the consequential triumph of capitalism in the 20th century as much as the ongoing unequal distribution of wealth led to the introduction of the often primarily socio-economic models such as American neo-evolutionary anthropology, that will be debated below in detail (Bourdieu, 1977b; Foucault and Gordon, 1995; Babić, 2005; Fernández-Götz, 2014).

In the sizeable portfolio of impactful ideas outlined by Marx, it is in particularly his description of how social relations change over time and lead to specific forms of domination and inequality that is essential for class or status identity. These forms of domination are defined by Marx as the attempted control of one group over the reproduction and production of another group, happening within and shaped by certain forms of property. Thus, within his theories, inequality, and power of one class over another is explicitly linked to economic relations (Miller and Tilley, 1984, 5; Babić, 2005, 68; Wilk and Cliggett, 2007, 83-90). On the opposite side of this argument stands Max Weber, who elaborated the subject of obedience to social rule. His studies focused partly on duty of voluntary submission and legitimacy of ruling parties. He also introduced the notion of 'exclusionary closure', which is defined as an endeavour of one group to secure power through branding others as outsiders (Babić, 2005, 68; Wilk and Cliggett, 2007, 108–111).

In relation to this thesis, this can be translated as a deliberate attempt to attain privileges in highlighting one common group identity and differentiating and tarnishing another, as in women or divergent ethnic identities, by enforcing in group biases Weber's ideas relate to social relations as a complex system. He considered people's social lives as being shaped by the values and subjective social conventions of their society at a specific time and context. These social lives and consequent social hierarchies, which include legitimacy as much as inequality, are not fixed, but influenced by historical events and a multitude of other sets of interdependencies. While Weber doesn't deny the importance of economic factors, he rejects its universal and absolute impact on social relations in opposition to Marxist theories. Where Marx argues that culture, belief, hierarchy, and social life in general is profoundly entrenched with economic factors, Weber argues the opposite. Both ideas and their

differences prevailed as part of the contemporary debate and further studies combined and extended on both arguments (Godelier, 1982; Babić, 2005, 68-69; Wilk and Cliggett, 2007–4, 108-111).

Before and after Second World War many of the more dogmatic and overly determined aspects of Marxist philosophy came under scrutiny or at least were refined. Prior to the war, Antonio Gramsci established the notion of '*hegemony*' (Gramsci and Henderson, 1998). In essence, he discussed how power is established by distributing and producing cultural norms and practices by promoting some and disfavouring others. As one social group produces and diffuses their '*hegemonic*' characteristics, others accept it. This concept is similar to both Bourdieu's 'doxa' and the Marxist 'false consciousness', as a state were the suppression or '*hegemony*' is consciously or unconsciously accepted as a natural reality. In contrary to Marx, Gramsci's '*hegemony*' is not reduced to economic factors but establishes other forms of maintaining and establishing power and inequality (Babić, 2005, 74; Fernández-Götz, 2014, 38). Louis Althusser (1984) on the other hand connected Marxist philosophies with structuralist concepts. He accepted the significance of economic aspects but considered economic relations as being structured by ideological and political spheres. Even more so in pre-capitalist societies. For Althusser it was especially ideological legitimation that is essential for maintaining dominance of one group over another (Althusser, 1984; Miller, 1989, 7-10; Babić, 2005, 74).

One of the most influential minds in regard to the relationship of power and knowledge, and their usage for control is Michel Foucault (cf.: Foucault and Gordon, 1995). In contrary to the Marxist concept of one certain class that dominates another, Foucault focused on the many different layers of power relations within societies. In correlation to this, another essence of his work relies on disciplinary technologies that conceptualised notions of how surveillance techniques restrict individual actions. Thereby, he associated issues as e.g., gender or 'madness' with power and domination, as they become institutionalist on various social levels, including families, schools, or work environments. Power in Foucault's mind is therefore an omnipresent aspect in almost every social relation and activity as a series of 'micropowers' (Foucault, 1977a; Foucault, 1977b; Miller and Tilley, 1984; Miller, 1989, 14-15; Babić, 2005, 74). In this definition of power, a constant resort of dominance via violence is not needed. It is rather established by the ability to ascertain a constant and systematic dominance imposed on the microlevel (Foucault and Gordon, 1995). By this logic, any study of identity is essentially also a study of power. Combined with aspects as 'habitus', acts of 'micropower' or any act of oppression politically or domestically should therefore be evident in the material culture, even in trivial aspects as decoration of ceramics, hair pins or bronze axes (Fernández-Götz, 2014, 37). A concept that is very similar to the more obvious ways of projecting power and dominance in numismatic contexts, like the use of subtle political messaging on the reverse of roman coinage (Bingler, 2001).

While he will be discussed in its own chapter (cf. 8.3), the significance of Pierre Bourdieu's concepts of 'habitus', 'doxa' and 'capital' in understanding power, class, their relation to group identities and its materialisation in the material culture must be emphasized again. Bourdieu, similarly, to Foucault, considered power and its preservation as a factor that penetrates every aspect of social conduct. By using 'symbolic violence', as with language, individuals are controlled and put in line (Bourdieu, 1977b; Miller, 1989, 15; Babić, 2005, 75; Wilk and Cliggett, 2007, 142-145). Both Foucault's and Bourdieu's work, highlight that social inequality and power are not exclusively related to economic aspects. Status, as Staša Babić (2005, 75) put it, should rather be seen as "socially constructed in constant negotiation and interaction by individuals and groups, taking up culturally specific forms dependent upon the particular historical and geographical setting." It is ultimately, Bourdieu's concept of 'capitals' (1986) that contradicts economic wealth as the primary factor for social stratification and class identity most apparently, since 'capital' incorporates 'economic capital' as much as 'cultural –', 'symbolic – ' or 'social capital'.

4.1.4.2 Neo-evolutionary Models or how to (not) Measure Status and Complexity

As mentioned above and in other chapters, the culture-historical approach in archaeology, that defined the early 20th century, and partially survived up until today, is often criticized for its lack of an explicit theoretical formula and implicit nature. Especially towards automatic correlation of hierarchy and wealth (Jones, 1997, 24; Biehl, Gramsch and Marciniak, 2002; Babić, 2005, 69). From these perceived methodical inadequacies stems the root for the paradigm shift that led to 'new archaeology' and a more 'scientific' method that emphasized a 'system thinking' approach. This also resulted in the need of a cross-cultural model for societies that corresponded archaeological data and all possible variations of social organisation. This need was met by deriving aspects of neo-evolutionary anthropology developed by authors as Service (1971), Fried (1967) or Sahlins (1968), to establish a model that generalised patterns of development of human societies, by constructing quasi evolutionary system that led from egalitarian to hierarchically stratified social systems. The link between this model as well as statistical and archaeological data was assured when Lewis Binford adopted 'middle range theory' for archaeology (Renfrew, 1973; Service, 1975; Binford, Cherry and Torrence, 1983; Babić, 2005).

Unsurprisingly, after overcoming the vague and implicit nature of culture-historical methodology, these new explicit models with positive causalities were seen as a paradigm shift (Babić, 2002, 79). Especially in the Anglo-American sphere, during the 1970s and 1980s, many archaeologists embraced this neo-evolutionary sequence of stages of social development, even more so in context with burial rituals. Consequently, large samples of ethnographic and archaeological data was gathered to create a model that met the cross-cultural generalised inference and could express the causality in between quantitative data and its interpretation (Binford, 1968; Tainter, 1978). This influential model

considered the rank of a deceased exactly reflected in the “measurable communal effort and invested in the funerary rite and erection of the *energy expenditure* monument” (Babić, 2005, 72). Therefore, according to the model, not only does the number of people that acknowledge the status of an individual directly relate to the status position of said person in any hierarchical social system, but it also entitles the deceased to receive a greater amount of effort, resources, and time for his or her mortuary ritual (Tainter, 1977, 332). Shortly after, an ecological context was added to this assumption, linking on-hand resources with social structure and control (Renfrew and Shennan, 1982). Aspects of this research area included, connecting monumental funerary constructions with claims over regions and their resources (Renfrew, 1982, 4), or the attempt to reconstruct social systems by linking control of resources and their exchange (Frankenstein and Rowlands, 1978).

From the latter notion stems the popular systematic of dividing societies into band, tribes, chiefdoms and states as stages of social evolution (Renfrew, 1982, 5). These classifications were rightfully criticised from the beginning. Despite this, their comparative value was acknowledged, led to broad adoption and spawned several alternative interpretations and subdivisions (Abb. Von F.G. 2014 S 33) (Fernández-Götz, 2014, 32-33). The labels used in these models should not be seen as imposed on past societies, but as a heuristic tool to understand and designate various forms of socio-political organisation or a ‘social typology’ (Kristiansen, 1998, 44-54; Collis, 2007, 524). Particularly the notion of ‘chiefdom’, became correlated to the rise of Iron Age elites and all aspects of ‘redistribution’ and general control over resources. By introducing settlement patterns and contextual funerary data, a distinct connection between a settlements centrality and size as much as between a central place and a central person was made (Renfrew, 1982, 3-5). While this assumption should be taken with caution when generalised, it led to a number of studies concerning ‘central places’ and their role as site controlled by a group or person that functioned as a centre of commerce and craft. Their relation to satellite settlements, the environment and exploitation of resources was subject of a number or quantitative studies and models, such as Thiessen polygons or catchment analysis (cf.: Hodder and Orton, 1976; Burnham and Kingsbury, 1979; Nakoinz, 2009; Nakoinz, 2013d).

While neo evolutionary concepts undoubtful led to a number of still used schemata and models, it only took until the emergence of critic towards New Archaeology, when these presumed neutral concepts of stages of social evolution became criticized as being essentialist, value laden and overall biased towards modern Wester values (Miller and Tilley, 1984; Babić, 2005). Particularly, its linear view of human history, that sees societies progress from simpler to a form of complexity that was synonymous with more complexity and thus implied western values and labels as ‘primitive’ vs. ‘developed’. These or similar classifications like, ‘passive’ vs. ‘active’, ‘barbaric’ vs. ‘civilized’ are scientifically unserviceable If levels of complexity are used, as within this thesis, they only should relate to socio-economic and/or technological complexity (Fernández-Götz, 2014, 33).

4.1.5 Identities of Religion

The role of religion as one of the longest lasting elements for group identity formation is as well-known as its intense basis for solidarity within social groups. Both aspects, as much as its role within power dynamics, has been critically debated by scholars such as Marx (1844a; 1844b), Feuerbach (1957), Durkheim (1912), Althusser (1984) or Weber (2016), and can be observed throughout history and our present days (Edwards, 2005). Despite this, archaeology still lacks a clear theory on religion in these regards, or even a clear approach towards it and naturally seldom goes beyond excavating and documenting sanctuaries or other presumed holy places (Renfrew, 1994; Derks, 1998, 11; Edwards, 2005, 110). If needed, theoretical concepts were derived from other social sciences, such as comparative religious studies, psychology, anthropology, sociology, as well as theology or history. Much as with identity, all these fields have their own set of overlapping developments and stands (cf. i.a.: for a psychological approach: Bird-David, 1999; or for a sociological approach: Norris and Inglehart, 2004).

Even more so than identity, religion is an inherently personal and conflictual topic. Violence from, against and in between religious group identities are a common historical occurrence (cf. i.a. for any act of iconoclasm: Besançon, 2000; or religious progroms: Bergmann, 2003; Pahl, 2003). Present archaeologists are also well aware of the destructive power religious identities can have on heritage sites after the destruction of Palmyra by the IS in 2016 (Cuneo, Penacho, Barnes Gordon, et al., 2015) or the Buddhas of Bamiyan in 2001 by the Talban (Manhart, 2009). Another example of friction points in between religious identities and science-based secularism is the ongoing political conflict in the USA, concerning the integration of either creationism or evolution in the curriculum of schools (cf. Scott, 1997; Moore and Cotner, 2009). This argument is not mend as yet another secular shot on religion, but as portrayal of the impact religious identities can have on any social structure and their collective memories. As well as the potential pushbacks any researcher must theoretically expect when researching aspects of religion, since, unsurprisingly, even today there are tendencies for research biases within religious motivated science, or archaeology (cf. Silberman, 1998, on American Biblical Archaeology).

In rare cases, such a dynamic can put any researcher in the crossfire from either end of the spectrum, extremely religious researchers, and more radical atheistic scientists. Such a circumstance, for example, can be found at the turn of the twentieth century, after the publications of '*Les formes élémentaires de la vie religieuse*' (The Elementary Forms of Religious Life) published by the French sociologist Émile Durkheim (1912). Among other hypotheses based on research on totemic societies in Australia, he considered the emotional stability acquired via community life, to be detriment to the emergence of religion. At that stage, the social and religious sphere were, according to Durkheim

(1912, 169), identical, and only over time did economic, political and scientific spheres emancipate themselves from religion, rendering it redundant. Although considered to be a 'militant atheist' by some even today (Edwards, 2005, 115), Durkheim's theses were immediately caught in that aforementioned crossfire of both religious (Richard, 1923) and rationalist groups (Belot, 1914). On one site would be the sociologist and Durkheim's former employee, Gaston Richard (1923) who criticized Durkheim for his 'sociological atheism'. On the other side were extreme rationalists that considered religion as a mere ideology, downplaying its role on societies as secondary at best, or being a mere derivate of ethic (cf. Belot, 1914; Pickering, 2010). Durkheim's social evolutionary stands should be seen critically and outdated today (cf. 6.1.4.2). However, it is noteworthy that despite, or maybe because of these controversies, his views did impact key minds as the French structuralists Foucault (Datta, 2008) and Levi-Strauss (Clarke, 1978), as well as Pierre Bourdieu (Saalmann, 2014) and as Edwards (2005, 115) suggests "must strike a chord with many post-processualist archaeologists".

4.1.5.1 Archaeology and the Issue of the Relativity of Religion

The importance of religion for studies on identity lies within its quality as a formative feature of social construction. Particularly, as argued by Edwards (2005, 116), its significance in dividing and uniting groups of people. This research perspective contrasts past historical constructions, that focused on religion as a primordial constant essence, as much as the modern secular scepticism and general intellectual antipathy towards religion that rather focuses on religion within a Marxists concepts or negates the impact of religion (Miller and Tilley, 1984; Parker Pearson, 1984). Past research traditions and the above stated potential controversies are far from the only issue that archaeologist must face when researching religion. This has various reasons. Many of these are methodological and lay within the issue that even attempting to find a universal definition of religion seems to be implausible. All religions, and their practices, are interlinked with their own context specific qualities. Presenting a wide range of varying possibilities, spanning from Totemism, Christianity, Taoism or Hinduism, as well as an unfathomable number of sub sects and denominations. As much as ethnicity, religion can be argued to be a cultural construct, always interlinked with its own culturally specific characteristics, constantly changing over time and space, tangible on a macro level but decreasingly so, further down the micro level (Asad, 1993, 29; Edwards, 2005, 114). Rendering religion relative.

This relativity contrasts with normative, essentialist and generally more restrictive conceptions of religion, which are fundamentally based on Western centric (Edwards, 2005, 127), or rather 'World Religion' centric traditions. Many attributes of relativity, such as religious change, historical construction or the blurry line between religions and philosophies are all observable within modern world religions. Christianity constantly changed, reinvented and segregated itself, so that today a number of approx. 41,000 denomination or organisations exists (Hackett, Grim, Skirbekk, et al., 2011). There is also an ongoing scientific debate on Hinduisms origins. Besides the Vedic religious traditions

that traces Hinduism back to the 2nd millennium BC, recent archaeological data (Chakrabarti, 2001) rather revaluated that date to later 1st millennium BC. However, a significant amount of research considers Hinduism to be an historical construct deriving from European orientalist, missionaries, British officials, and native nationalists (Lorenzen, 1999). Finally, there is the long-lasting debate if Buddhism (Rajapakse, 1986) or Confucianism (Clarke, 1978) can be even considered a religion, rather as philosophy or rather something in between. These dynamics and debates show a complexity, that only ever increases as religious identities constantly interact with endogen and exogen variation of itself, while intersecting with any other group identity.

At this stage, we must distinguish between religious beliefs and religious practices. The variability of enacted religious identity renders even the most plausible interpretation for pre- and proto historic religious beliefs an educated shot in the dark. Religious practices, however, are less intangible than belief systems, since a considerable amount of such practices manifest within the archaeological record, as sacrificial or votive sites, sacral places, and burial rituals. Particularly the work of Mike Parker Pearson (1993; 2009; also cf. chapter 8.1), formulating an archaeology of death, allows us to better understand how pre- and proto historic communities dealt with death. Therefore, making aspects of their afterlife palpable by analysing specific sets of burial rituals. This, consequently, also benefits our understanding of a community's social construction as a whole, since intersectionality of group identities are evident in most forms of burial customs.

4.1.6 Identity of Occupation and Other Group Identities

All artificially created category systems do reach their limits at a certain point. The five basic group identity categories, as presented above and within other publications (Díaz-Andreu, Lucy, Babić, et al., 2005; Fernández-Götz, 2014; Ramsl, 2020a), serve as useful tools to feature all potential fundamental identities that can be expected within a burial context, as much as they display their complex intersecting nature. However, certain variations or 'hybrids' of the base group identities, such as an 'Identity of occupation', can be considerably more significant for a social group's power dynamic and coherent identity, depending on their specific cultural contexts. Occupations and crafts, for instance, can act as the very foundation of a social structure. Within the Indian caste system, the notion of '*Varna*' serves as its framework for classifying individuals (Bayly, 2001, 8-10). These classes are predominantly separated by their occupation, namely, *Brahmans* as priest, *Rajanyas* or *Kshatriyas* as rulers, warriors, and administrators, *Vaishyas* as artisans, merchants and farmers, *Shudras* as the working class and *Dalits* as a category of all outliers [6]. Since occupational identities and other potential

[6] It is important to note that other scholars as Ram Sharan Sharma (2002, 10) consider that the Rig Vedic society was originally structured according to kinship, tribe, and lineage, rather than social class, money, or variations in those factors.

alterations can be expected to be apparent in this thesis contextual framework, a brief concluding discussion on those remaining more essential group identities seems relevant.

Beginning with the aforementioned occupation-based identity, its role and impact for group identification is mostly debated when intersecting with gender (cf., i.a.: McCafferty and McCafferty, 1991; Ramsl, 2020a, 169) or class identities (cf., i.a.: Stöllner, 2007). This makes sense, since an individual's gender, age, social rank or in some cases even religious and ethnic identity will inevitably be an essential aspect of any chosen or forced career path (Gero, 1991; Demoule, 1999a, 196; Babić, 2005, 102 and 108; Díaz-Andreu, 2005, 31-34; Lucy, 2005a, 47). However, this often disregards that occupational groups, such as local craftsmen and craftswomen, farmers, or priests and warriors will most likely format their own group identity. Additionally, if any conflict of interest arises, these occupation-based identities can situationally superimpose any of the five core group identities. There are many well-known historical contexts, i.a. the medieval guild system (cf. Oexle, 1979) or occupation based Roman '*Civil Collegiae*' (cf. Verboven, 2011), that show that common occupational identities formed their own associations within cities or early states, to oversee their craft and trade, but also to defend their legal rights before other bodies of rule.

One specific occupational identity, an identity of '*Esprit de Corps*' or '*Korpsgeist*,' has historically been even more impactful and ardent than some base identity groups (cf., i.a. Steinacher, 2009, 274). This group identity is based on camaraderie of military units, special bodyguards, or mercenary groups, that consider each other as 'brothers in arms', based on their connective shared combat experiences (cf., i.a. for modern studies on military identity: Hart and Lancaster, 2015; 2017). Although the initial membership of such groups is regularly restricted based on gender, ethnicity, or religion, in many cases this initial dynamic shifts, so that being part of a military corps and their common identity superimposes over an individual's ethnicity, gender or religious identity (Hart and Lancaster, 2017).

This line of reasoning is part of the already touched upon debate considering ethnic identity within Early Medieval archaeology (cf. Bierbrauer, 2004; Pohl, 2006; Steinacher, 2009). The argument is that historical groups such as the Langobard's or Huns, even if originated and ruled by an initial ethnic or kin group, should be rather considered as a diverse military corps that any skilled and willing combatant could join. This dynamic can be even traced to written sources such as the equally mentioned text passage by Priscus of Panium (cf. 6.1.2, p. 49; also: Steinacher, 2009, 274). Such corps identities can be enforced, as with the Osman Janissaries (Radushev, 2008), emerge naturally over conflicts and traditions as the Pontifical Swiss Guard (2022), or can be based on common objectives, such as fame and fortune. A motivation that can be assumed for most mercenary groups in history, much like those 'Celtic' mercenaries evident in Early Iron Age written accounts (cf. i.a.: Tomaschitz, 1994; Ramsl, 2003).

In further cases, a common denominator could be a general or leading figure (cf. Tomaschitz, 1994, 34-47). This is prevalent in the later stages of the Roman Republic, when legions identified themselves with figures as Caesar or Sulla, rather than the Republic and City the actually should protect (Brunt, 1962, 75-79). This example leads to another group identity, an 'identity of fealty'. This concept similar to 'cult of personalities', is equally prevalent in Roman civil history, as the 'Patronage' system (cf. Nicols, 2014). Even though neither entirely provable, nor applicable generalised, a similar system has been indicated by Caesar and consequently discussed for parts of 'Celtic' Early Iron Age military groups (Tomaschitz, 1994, 34-47; Dobesch, 1996, 50-71) and can argued to be a connecting element for unrelated participants of extended family groups (cf. Fernández-Götz, 2014, 48-49; Ramsl, 2020a, 19).

There could be a prolonged discussion since there are a sizeable number of further context related group identities. Particularly in complex frameworks as urban centres, or if a living reality allows recreational habits, something akin to an 'identity of leisure or passion' can format. Although predominantly a modern phenomenon (Kimminich, 2003, 8; Hansen, 2007, 20-24), it should not be entirely disregarded for past- and proto historic contexts. We do know that variations of sport competitions, such as chariot races or dumbbell fighting's are evident for the Central European Early Iron Age Context since at least the 6th century BC (cf.: Rebay-Salisbury, 2012). Although largely correlated with religious and power related aspects, this structural motivation does not contradict that participant enjoyed their task and took part as semi 'amateurs', having another day-to-day craft, making their participation a 'past time'. There are plenty of written accounts for historical monarchs that indulged in a leisure activity, such as the vivid Tennis enthusiast Henry VII Tudor (Thurley, 1993, 185-188).

We do not know if any ancient or historic individuals, elite or not, did personally identify themselves predominantly on their leisure activity as it is common in modern times. One likely example could be the Emperor Commodus, from whom we know that he fought, cheatingly so, presented and arguably identified himself as a gladiator for his own entertainment and vanity (Hekster, 2021, 146-153). Suggesting he did at least partially identify himself with being a gladiator. More importantly there are early historical accounts for organised entertainment-based group identities. A particular infamous example are the organised chariot racing factions from the 5th century AC onwards in Byzantium. These factions were essentially organised fan groups of chariot racing stables, that enacted immense domestic political powers even during Justinian reign (Cameron, 1976; McComb, 2004, 25; Gregory, 2010, 131-133). Highlighting the variety and social impact of organised group identities in ancient times. Even those based on seemingly trivial activities.

4.2 Individuality, Structuralism, and their Supposed Contradiction

After thoroughly presenting and debating various interdependencies of individual and group identities this chapter will conclude by considering two related issues. First, the perceived dichotomy of 'individuality' versus 'structuralism', 'agency' versus 'structure', 'individual identity' versus 'group identities', 'objectivism' and 'subjectivism'. Second, how contemporary perceptions of individuality, can affect and subsequently distort any interpretation of Pre- and Protohistoric interdependencies of agency and structure. Many of these issues, particularly the above stated dichotomy of individuality and structuralism, were already introduced when 'identity theory' in sociology and the social sciences was outlined (cf. 5.2.3.2). A distinct chapter seemed still obligatory for a debate that remains quintessential for understanding identities in general. It is particularly the perceived dualism that needs to be emphasized, the notion that something must be either A or B. These exaggerated oppositions were deconstructed only in the second half of the twentieth century. Before that point, both extreme ends of the debate had been overemphasized, either by early sociologist that gave individuals no real agency embedded in a structed society with determined social norms (Wagner, 1999, 53; Davidovic, 2006, 42-43), or as many post processual archaeologists did after overcoming the former paradigm, by focusing on agency and in turn neglecting the impact of structure (Gardner, 2008; Fernández-Götz, 2014, 15).

Nonetheless, today's consensus is that both concepts are inevitably linked. There has to be a structure that provides social norms that individuals can abide by or rebel against, just as it takes actors to create and maintain such a social structure. Moreover, both agency and structure are essential for either group or individual identity formation, as they remain in a constant feedback loop (Gardner, 2008; Fernández-Götz, 2014). Anthony Giddens (1984) and Pierre Bourdieu (1977b) specifically deconstructed the former contradiction of agency and structure. Bourdieu's concept of 'habitus' (cf. 8.3), as a set of procreative, normative patterns, perceived and transformed by individuals, can be considered as a link that incorporates both individual agency and social norms. Giddens considered both 'structuralism' and 'functionalism' as 'actionalist theories', as defined by Alain Touraine (1973)[7]. Giddens way to solve the issue was his 'theory of structuration' (Giddens, 1984). This theory emphasises that the formation and generation of any social system can only be understood by analysing both agents and structure without emphasizing either. What he dubbed 'cycle of structuration', is similar to the above coined feedback loop, and is roughly described as agents that interact with a social system in their specific time and space. Social systems within his theory are

[7] 'Actionalism' considers the individual actor as the primary agent of a social system and not a mere component.

equally enacted by interaction and routinization of structure and agents. These agents should not only be considered as individual actors but also can also refer to groups such as families.

We see that theoretically, there is constant interdependency of agents that act and interact freely within a limited, often inherited system they cannot control directly. This duality should be considered as a spectrum, which is very much dependent on a specific time and space. One apparent case for highlighting the dynamics and changing nature of 'agency' and 'structure' is India and its Caste system. It is not only an example of how, even in our modern world, societies persist in which identities are highly predetermined, imposed, and unchosen, but also that such systematics change fundamentally on a micro level by interaction of individual agents. In today's urban India inter-caste marriage and dating have become common and almost doubled overall from 1981 to 2005. However, nationwide these marriages are only 6.1% of all marriages. The vast majority of these marriages are still mostly limited to classes with higher education and economic freedom (Goli, Singh and Sekher, 2013). That indicates that even in an extreme predetermined social structure; a. individuals do have a certain level of agency in choosing aspects of their identity, b. this agency is still vastly limited by social norms or other facets of their intersectional identity such as class (cf. 6.1.4) or religion (cf. 6.1.5). This example shows that if we want to understand any society's cumulative identity, we must have at least some understanding of a society's social norms, institutions, and traditions, while acknowledging potential variations on a micro level enacted by individual agents.

4.2.1 Individuality and the Awareness of Presentism

There are some historical scholars that still advise caution and consider applying modern notions of individuality towards pre- or protohistoric societies as presentism. Manuel Fernández-Götz (2014, 16-17) stressed this conception, as he likewise highlighted the otherness of the Iron Age and warns that many present applications of 'action theory' overemphasize the modern concept of the individual seen as the main protagonist of History (also cf. Dülmen, 2001; Hernando Gonzalo, 2004). This argument partially reflects those above debated notions in sociology that individuality is a mere modern notion, but also highlights that neither individuality, nor perceived realties are a constant concept. Part of this cautioning is that acting to the disadvantage of the structure is argued to be a very modern or neoliberal notion, that carries ethno- and Western centric overtones. This is generally put in contrast with societies, that enact a lower level of socio-economic complexity, wherein identity is more relational towards groups (Elias and Schröter, 1987; Fernández-Götz, 2014, 16).

This definition of 'modern individuality', essentially describes an individual that primarily depends on him or herself, delving in a vast pool of choices and alternatives, and disregarding or potentially acting in detriment of the community. Therein lies a problem, for this argument equates modern individuality not only with its Western variant, implying neoliberal and libertarian attitudes that place individual

freedom and gain above the good of a group, but also with egoism and narcissism. This equation is understandable, as the same notion remains a cornerstone of capitalism criticism (cf. i.a.: Marsdal, 2005; Norton, 2014; Rollert, 2014; Samol, 2019) and is even subject of several psychological studies (cf. i.a.: Lasch, 1980; Piff, Stancato, Côté, et al., 2012; Layton, 2014). Due to the political nature of this subject, there are of course plenty counterarguments to be found (cf. as a refutation of Lash: Mazlish, 1982; also cf.: Snowden, 2014, 3-21). Many of these (Snowden, 2014, 8) frequently cite the 18th century Scottish pioneer of political economy and philosopher Adam Smith (2011, 400) and his general statement that an individual can pursuit self-interest while serving the interest of others by increasing the value of the economy.

Regardless of political opinions and theories, Smiths statement is neither right nor wrong. It rather shows that even in a capitalist society supposedly based on 'greed', a hypothetical advantageous middle ground between structure and individuality remains. Either way, all this should demonstrate that the initial argument by i.a. Manuel Fernández-Götz (2014);

a. simplifies modern individuality, or individuality in socio-economic complex systems towards the egocentric spectrum of the agency vs structure debate.
b. Although this argument is plausibly based on present neoliberal tendencies that overfocus on individual gain, there are still many global contemporary political, cultural, and social philosophies that differentiate from this perspective. Among them, variations of socialism (Marsdal, 2005), the vast spectrum of political systems that follow statism [8], such as authoritarianism (West, 1988) or even welfare states (Esping-Andersen, 2001), as well as the Confucian concept of social harmony that to this day influences East Asian cultures (Feuchtwang, 2009). All share philosophical tendencies that emphasize the structure before the agent.

That being said, despite the preceding arguments generalising interpretation of modern identity, the other side of the argument, that warns of potential presentism when interpreting past societies, remains true. As ethnographic evidences show (i.a.: Leenhardt, 1971), researchers must be aware of differences in perception of reality and individuality any past societies potentially bear. In particular, societies with less economic and social complexity. This is consistent with the hypothesis that individualization first accompanied the emergence of social complexity and division of labor (Hernando Gonzalo, 2007, 171).

[8] Statism is the political theory and practice of concentrating all relevant power, economical, social or political, in the governing body (Schubert and Klein, 2020).

For that purpose, Fernández-Götz (2014, 16) further argued that the mechanisms of metonymy and metaphor, or the difference between oral societies and those that pass down their tradition in writing, is crucial for the formation of individuality. Oral traditions are expressed metonymically, hence with symbols or myths, and are passed down directly by their community. Consequently, identity within oral societies is argued to be both more relational and interdepended to the structure and their society. Written knowledge on the other hand favours metaphors. Thereby increasing the level of "metaphorical representation of reality" (Fernández-Götz, 2014, 16), and consequently enhancing an individual's capability for abstraction and rationality, the awareness of being unique emerges (cf. Olson, 1994; Hernando Gonzalo, 2004). While this proposition does seem constructed on first sight, we do know that the emergence of writing is actually often historically linked with increasing socio-economic complexity as with Mesopotamia (Robinson, 2003).

4.2.2 Agency and Structure in the Traisen Valley

Applying these considerations on Early Iron Age societies within the research area, a contradictory issue arises. On one hand, there are vast evidences that show signs of social complexity and centralisation in most surrounding areas of the Traisen Valley as early as Late Hallstatt period (cf. chapter 7.2.2; also, i.a.: Krausse, 2008; Egg, 2009; Echt, 2016; Fernández-Götz and Ralston, 2017). Similar signs of a higher degree of individuality emerged by the rise of new elites and their need for self-expression (Demoule, 1999b; Echt, 2016; Fernández-Götz and Ralston, 2017). While the Traisen Valley communities had an agricultural character, consisting of smaller farmsteads and larger villages as Inzersdorf (Trebsche, 2020d) this need for self-representation is still evident by a number of enormous burial mounds, as in Gemeinlebarn (Eckkrammer-Horvath, 2015), or self-staging figural depiction on the situla of Kuffern (Urban, 2006; Trebsche, Bagley, Karwowski, et al., 2020, 468).

By and large, it seems reasonable to assume that at least the elites fully understood their own individuality. While this is not as easily assumable for common people, it seems implausible that communities surrounded by individualistic landmarks such as burial mounds did not understand their own individuality. On the other hand, regardless of the argued social complexity of Early iron Age societies, it does not negate Fernández-Götz (2014) argument that Iron Age societies still; "remained largely myth-based and displayed a much less advanced process of individualisation than our modern Western society." We should therefore not consider the consciousness and perception of individuality indicated above as equivalent to modern variants. Rather as an amalgamation of individualism that entails both, facets that are entirely unique to a specific society, shaped by myths, traditions and living realities we can't fully comprehend today, but also of aspects that can seem very familiar or 'modern'. In that sense, individuality could simple be defined as a state of awareness of one's own uniqueness and agency. Being aware of one's own agency does allow both, 'relational' identities, and almost

modern individualism to coexist as both ends of a spectrum, defined by an individual's specific living reality within a structure.

Fortunately, apart from its significance for comprehending individual identities and their agency within their structure, this issue is largely complementary to this thesis's methodology. Even if it would be argued that Early Iron Age individuals in the Traisen Valley were as much aware of their agency and individuality as most people in history, besides elites, their individualism would largely remain invisible within the archaeological funerary record. As we will see in chapter 8, this is simply because they did not bury themselves (Parker Pearson, 1993, 203). Much like a modern conservative father would likely not bury his punk son in his subculture attire, but in the family's traditional funerary garb, it is very much unlikely that an individual non-conformist in the Iron Age Traisen Valley would have been buried in any other way but the traditional one, his or her family deemed appropriate. Moreover, even if they did, and a person's individualistic and specific idiosyncrasies where respected by its family or community that buried that person, we have no real ways of differentiating this from forced traditional burial rituals. There would be the possibility that these individuals present themselves within this method as 'noisy data' outside of the clusters. But even then, any such interpretation would remain speculative.

5 Framework – The Early Iron Age in the Traisen Valley

Following the introduction and outline of this master thesis holistic working apparatus, the subsequent chapters serve the purpose to introduce the spatial, chronological, and social framework. The main body consists of a description of geographical and temporal limitations, archaeological research history, a brief summary on the titular period of transition and contemporary macro social structures and consequent implications for the Traisen Valley. While most arguments are based on established archaeological sources, some elements of this chapter, such as the macro- and micro-dynamics that drove the transition from Hallstatt to La Tène, will be supported by historical sources, (cf. i.a.: Tomaschitz, 1994), social anthropological considerations (cf. i.a.: Nakoinz and Lüth, 2018) and scientific studies (cf. i.a.: Steffen and Steffen, 2010; Scheeres, 2014). By doing so, a wide range of contextual knowledge is collected to aid in establishing the most logical interpretation, recognising that accessing identity through material culture is only feasible within a well-known framework (Hakenbeck, 2004, 3; Popa, 2018, 54).

5.1 Chronological Framework

This, as well as the following chapter 7.2, do not only present necessary contextual information, but also describe the chronological and spatial limitations for the data used in the clustering procedure. While spatial limitations, at least within this methodology, occur naturally by choosing certain

cemeteries, chronological boundaries are more constructed based on two considerations. Firstly, by the very question asked in this thesis title, as in 'Group Identities in a Period of Transition'. Since the complexity of this transitional period's social changes is the subject of subchapter 7.2.2, it is sufficient to state that archaeology traditionally equates this period with the Early Iron Age and dates it from the late Hallstatt to the early La Tène. More specifically from HA D1 to LT A (Neugebauer, 1992, 13; Romsauer, 1996; Ramsl, 2018a, 499). These chronological limitations are not definitive, as transitions rarely are. They rather differentiate on a regional level, in some cases significantly even from one neighbouring cemetery to another. This is observable as certain material traditions occur in some cases earlier (cf. Pescheck, 1996) and in some other cases remain for longer, as in various graves in Oberndorf like Grave 31 or 121 (both OBD/84; also cf.: Ramsl, 2018a).

This argument leads to the second limiting factor. Credible evaluation of group identities within cemetery contexts is only possible if all burial data utilised for clustering procedures remain within a continuous cultural framework. Only if an evident multi-generational continuity exists within a society, manifesting itself in cultural and material characteristics, can potentially clustered and visualised social hierarchies or group identities be comprehensively compared. This resulted in an intriguing situation in Oberndorf. Traditionally, while later Roman and earlier Bronze Age phases within the cemetery are evident, a continuous burial continuity of the Iron Age cemetery was only considered within Late Hallstatt and La Tène A/B (Neugebauer, 1992; Jerem, 1996, 93). In course of this master thesis by researching, gathering, and re-examining all excavation data from Oberndorf up until 2020 (cf. chapters 5.1.1.1, 9.5.1 and 13.1), a possible continuity, arguable from at least HA C, maybe earlier became noticeable.

This is not entirely surprising as neighbouring cemeteries like Franzhausen also show a continuity from at least Late Hallstatt up to Middle La Tène (Neugebauer, 1992). While several burials in Oberndorf from HA D to LT B were deliberately laid out around older burrows or structures, it was especially grave 121 (OBD 82) that allowed such a preliminary assumption. Within this grave a female individual was buried directly above an older at least early HA D or even HA C cremation (Neugebauer and Gattringer, 1982, 67). This could signify a conscience connection to the late Bronze Age population in Oberndorf. To be clear, this correlation remains a hypothesis at this stage. Furthermore, as many of these HA B or C burials are cremations, they could only be reliably dated in rare cases, in some others not at all or only with reservation.

As a result, the decision was made that the chronological limitations for graves used within this statistical application remained within HA D and LT B, which represented the transitional period in Oberndorf most appropriately. That being said, when deciding whether or not to utilise a burial as data for this methodology, the decision was theoretically based on a definitive social continuity rather than

a precise chronological basis. It is also quintessential to omit data that could falsify a statistical result. Hence, such graves that could not be chronologically definitively determined were not included in the clustering procedure.

5.1.1 Relative and Absolute Chronology for Early Iron Age Eastern Austria

Most modern relative chronological divisions for Central Europe are based on the work of Paul Reinecke in 1902. He devised a quartering division, separating Hallstatt period into the late Bronze Age period, or HA A – B, which corresponds to 'Urnfield Culture', as well as what today is considered as the actual 'Hallstatt Culture', HA C – D (Reinecke, 1902a). A similar four-tiered division was proposed by Reinecke for La Tène with LT A, B, C and D (Reinecke, 1902b). This division was built upon Otto Tischlers 1885 trisection of La Tène period into three phases (early, middle, late), which moreover became the early standard in France after Joseph Déchelette adopted it as La Tène I, II, III (Tischler, 1885; Déchelette, 1914; Rieckhoff, 2008, 3-4). Reinecke's system is the basis for the modern chronological layout that characterizes LT A and B as Early La Tène and together with HA D as the Early Iron Age, while LT C is considered Middle La Tène and LT D as Late La Tène (Neugebauer, 1992, 11; Rieckhoff, 2008, 3-4; Trebsche, 2020b, 19). It is important to note that these relative chronological systems are not intended to be used as a depiction of past realities (Rieckhoff, 2008, 4; Collis, 2012a; Fernández-Götz, 2014, 9).

Today we are able to subdivide these phases even further as they are built upon - and constantly revaluated - intrinsic typological studies of characteristic recurring fibulae, vessels, weapons, glass bracelet or for later periods even coinage types and hundreds of variable groups object categories within burial complexes. Particularly essential for this are formulated chronology systems based on the primary 'index fossil' fibulae, such as the works of Rupert Gebhard (1991) and Sabine Rieckhoff (1992) for South and Central Germany [9], or Jozef Bujna (2003) for Eastern Central Europe. Thanks to this and also depending on other contextual aspects, such as grave orientations, or stratigraphy, we are able to date accurately within a 50-year interval (Panke-Schneider, 2013, 2-23; Trebsche, 2020b, 19).

[9] It is noteworthy that Sabine Rieckhoff (2008, 7-10) herself highlights issues, such as discrepancies in between the older and newer Manching based chronology systems, that ensue if an artificial chronology system and historical dates are paradigmatic interlinked.

Period:	Relative Chronology	Approx. Absolute Chronology	Additional contextual approx. dates
Late Hallstatt	HA D1	620 – 530 BC	600 BC, Founding of *Massalia*
	HA D2	530 – 510/500 BC	500 BC, Heketaiois mentions Celts
	HA D3	510/500 – 450 BC	
			460 – 440 BC, Kuffarn Grave 1
Early La Tène	LT A	450 – 380/390 BC	400 – BC, 'Celtic migration' to the South 400 BC, 'Climate Crisis'
	LT B1	390 – 325 BC	387 BC, Battle of Allia, sack of Rome 380 – 350 BC, Pottenbrunn Grave 1005 335 BC, Alexander meets Celtic Envoys
	LT B2	325 – 250/260 BC	298 – BC, 'Celtic migration' to the Balkans 295 BC, Roman victory at Sentinum 279 BC, Sack of Delphi
Middle La Tène	LT C1	250/260 – 200 BC	225 BC, Roman victory at Telamon
	LT C2	200 – 150 BC	
Late La Tène	LT D1	150 – 75 BC	125 BC, Founding of *Gallia Narbonensis* 113 – 101 BC, Cimbrian War
	LT D2	75 BC – 15 AD	57 – 51 BC, Gallic Wars 15 AD, Drusus Alpine conquest

Fig. 8: Simplified Chronological table of the Iron Age Period. For this period relevant Periods are framed red (adapted from Neugebauer 1992, Trebsche 2000 and Fernández-Götz 2014).

Absolute Chronological dates are in general only attainable if either scientific methods, like dendrochronology or radiocarbon dating are applied, by linking archaeological sites with historical dates, or imported goods from regions with an historical validated chronology as e.g., Roman or Hellenistic coinage (Trebsche, 2020b, 19). Even more unfortunate is that, because dates between 800 and 400 BC fall in a flat area of the C-14 calibration curve and cannot be precisely dated, absolute dating by scientific methods is challenging during most of the early Iron Age (Venclová, 2008; Rebay-Salisbury, 2016a, 46).

such absolute dates are unattainable within the chronological and spatial framework of this master thesis, particularly dates that correlate with historical events during the Early Iron Age in North-Eastern Austria. Similarly rare are absolute dates based on imported goods that correlate with a validated chronology. Although such findings are at least evident for the earlier periods HA D and LT A, this rarity is especially noticeable in comparison with neighbouring regions as Western Austria, Bohemia and

Southern Germany, (Hansen, 2012; Trebsche, 2020c, 258). These rare exceptions are most famously represented by the figurative situla found in Kuffarn grave 1. Moreover, since the grave has been dated in between 460 and 440 BC, this buried individual can be considered as a contemporary of the titular transitional period (cf. Trebsche, Bagley, Karwowski, et al., 2020, 466-471). From LT B onwards until the beginning from LT D there is an observable regress of Mediterranean import goods, that is sometimes correlated with Celtic expansions to Southeast Europe starting between the 3rd and 4th century BC. Albeit rare exceptions in Upper Austria remain, as with the bronze Situla type D (traditionally dating in the 5th and 4th century BC) from the LT B grave 13 in Mannersdorf am Leithagebirge. (Neugebauer, 1992, 100; Ramsl, 2011, 155; Trebsche, Bagley and Karwowski, 2020, 20, 258).

Dendrochronological or radiocarbon dates are similarly limited within the Traisen Valley. The most important exceptions being three radiocarbon dated graves at the Pottenbrunn cemetery, which is situated less than four kilometres to the south of Oberndorf and Ossarn. Out of all these graves, 520 (410 – 220 BC), 565 (520 – 200 BC) and 1005 (380 – 350 BC) were dated based on bone and charcoal samples. In particular, grave 1005 which date corresponded with relative chronological classifications in between LT B1 and LT B2. This relative date range in itself was based on the burial good composition, specifically a fibula type '*Duchcov*' (or *Dux*) (Ramsl, 2002, 147, 359-360). Further absolute dates only can be attained if we extend the spatial framework to its neighbouring regions. Besides similarly ^{14}C analysed sites in Lower Austria as Roseldorf (Holzer and Stadler, 2008) or Michelstetten (Trebsche, 2010), two important dendrochronological dates from Dürnberg bei Hallein should be noted for their relation to the transitional period. The first being the wooden ground sill of an Early La Tène house (1/1988) in the Ramsau Valley, dating to 433 BC, whereat, another, stratigraphically older house (2a/1989) of the same site contained an open worked bell hook typical for LT A. The second are timbers used to build the burial chamber of grave 352 from the Hasenbichl, dated to 464 BC. Importantly this grave also contained a fibula type 'Decorated End' that is characteristically for HA D3. All of these dates combined led to the conclusion that the transitional period of Hallstatt and La Tène at the Dürnberg can be at least approximately dated in between 460 and 440 BC (Sormaz and Stöllner, 2005, spec.: 370; Trebsche, 2020b, 19).

Lastly for the neighbouring Central Eastern European regions, especially Czech Republic, absolute dates were cumulatively presented by Natalie Venclová (2008, 21) and are based on a number of sites, e.g., Radovesice (Neustupný, 1993) or Mšecké Žehrovice (Neustupný, 1998). These absolute dates are however considered imprecise by Venclová herself due to methodological inaccuracies with thermoluminescence dating and more particularly for radiocarbon dating related to the calibration curve in between 800 and 200 BC. Despite this caveat her presented absolute chronological dates become the basis for recent regional chronological refinements, such as Moravia (Golec and Fojtík,

2020, 24, obr. 3). Considering only the periods relevant to this thesis, the approximate absolute dates are as follows: 500 to 450 BC for HA D3, 460/450 to 390/375 BC for LT A, 390/375 to 330/320 BC for LT B1 and 330/320 to 260/150 BC for LT B2 (Venclová, 2008, 21, Tab. 1).

5.2 Spatial and Social Context

As established, group identities are affected by a substantial number of reciprocal effects. Few are as impactful as a communities perceived collective and individual experience of their living reality. Since human social and spatial interaction acts as a catalyst for group identity formation, reformation and conservation processes, an understanding of these social and spatial environments this interaction occurs is essential for any interpretation of past group identities. Part of this context is the natural environment of Oberndorf, Ossarn and Inzersdorf, as well as the Traisen Valleys community's social framework, both on a regional and supra regional level. Staring with a depiction of the Valleys natural environment and geography.

5.2.1 Geography, Natural Environment, and Spatial Structures of the Traisen Valley

The river Traisen is a southern inlet of the Danube in northeast Austria and has an approx. length of 80 km. It is formed in the south by its headstreams the Türnitzer Traisen and Unrechttraisen, and only has one larger tributary, the Gölsen. The Valley is situated in Lower Austria's southwestern regional quarter, the Mostviertel. Since the 'Lower Austrian Spatial Development Perspective program' in between 2010 and 2012, it was furthermore administratively reallocated to the new 5th quarter, 'NÖ-Mitte' (Land Niederösterreich, 2022b). It is surrounded by the Dunkelsteinerwald to the west, the Tullner Becken and Wienerwald to the east and the Lower Austrian Prealps to the south. More precisely, what is referred to in this master thesis and many publications before as the Traisen Valley, is actually the Lower Traisen Valley, which is traditionally located in between the Lower Austrian capital St. Pölten in the south, and the Danube's estuary, close to Traismauer, to the North (cf. fig. 5; Land Niederösterreich, 2022a). The Fladnitz stream west of the River Traisen, while having its own smaller valley, often gets incorporated to the Lower Traisen Valley archaeological contextualisation as for its direct geographical proximity (cf. fig same as above).

The following description of the valleys natural environment is based on the official Austrian forestall growing areas (Kilian, Müller and Starlinger, 2021), as it integrates geology, topography, climate, soil and vegetation in its classification systematics (cf. for all Lower Austrians areas: Kohler-Schneider and Trebsche, 2020, 33-34). Within this systematic, the Valley is part of the '*Wuchsgebiet 7.2: Nördliches Alpenvorland - Ostteil'*, that is the eastern part of the northern Prealps natural environment. This area is characterized by its hilly country and terraced landscape. As it is generally allocated to the Molasse zone, its geologic setup consists of tertiary sediments that are clay, marl clay, sand, and sandstone. These are themselves superimposed by quaternary gravel and loess that often are structured as

terrace steps. Specifically important in regard to the soil are the highly fertile alluvial deposits, and archaeology wise, pararendzina and light brown earth that rest on the terrace gravel as for their preserving nature for skeletal remains (Kohler-Schneider and Trebsche, 2020; Kilian, Müller and Starlinger, 2021). This fertility of the Valley is crucial beyond being a base reason for colonisation, as it seemingly also allowed its population to outlast several climate fluctuations unscathed (cf. Maise, 1998; Trebsche, Bagley, Karwowski, et al., 2020, 471). As for the consistent agricultural utilization from Early Bronze Age periods at the latest, it seems furthermore likely that the natural vegetation of forest steppes as well as oak mixed - and oak hornbeam forests has been long changed until the Early Iron Age. Considering various utilisation possibilities a rudimentarily deforestation is more likely than not (Kohler-Schneider and Trebsche, 2020, 47).

All of these variables affected the fundamental geographical structuring of communities, farmsteads, and burial grounds. Similarly, to the Early Bronze Age, most settlements and farmsteads were either established in direct proximity of, or directly behind the terrace edges (Neugebauer, 1992, 28; Ramsl, 2020d, 403). As for the Traisen rivers tendency for recurring and severe floodings [10], it should be expected that the direct flood plains remained mostly uninhabited (Kohler-Schneider and Trebsche, 2020, 47). The settlements, or rather an interconnected network of small villages and individual hamlets or farmsteads was established, probably due to the recurring floodings, at the flood-protected lower terrace edge of the River Traisen (Neugebauer, 1992, 47; Ramsl, 1995, 48). Most associated cemeteries, much like Oberndorf and Inzersdorf, were erected approx. 100 m inland on the often slightly elevated lower terraces (Neugebauer, 1992, 28; Ramsl, 2020d, 403). An exception to this is Ossarn, which burial ground is located relatively close to the former escarpment (Neugebauer, 1992). As of now no further settlement or hilltop site could be found within the valley beyond these single farmsteads and the single accounted larger village that is Inzersdorf – Walpersdorf. Despite this, there is still much scientific debate about whether the lack of these sites is simply a research gap (Trebsche, 2020d, 99). This assumption is supported by aerial photography surveys that show that all three cemetery sites, used for this master thesis, are at least approx. as large as the Franzhausen necropolis (Ramsl, 2020d, 402), suggesting a possible higher population density.

5.2.1.1 The Village Inzersdorf – Walpersdorf

Due to several rescue excavations at the settlement vicinity (cf. 5.1.1.3) a partial area of roughly 1,35 ha of an estimated toral area of approx. 3 ha, was extensively researched and published by Peter Ramsl (1995). Whereas a settlement peak can be identified for LT A, much like other Traisen Valley sites, the

[10] In between the years of 1541 und 1880 thirteen mayor floodings were documented (Kulturverwaltung Sankt Pölten and Sankt Pölten-Spratzern Aktivtage, 2002). In 2022, until August, the highwater alert threshold at the measuring station Herzogenburg was passed 7 times (Land Niederösterreich, 2022c)

archaeological context presented a continuity starting from late Hallstatt to the beginning of LT C (Ramsl, 1995, 44-47; Trebsche, 2020d, 64). Among these contexts are pole buildings, beam constructions, oval storage pits and 30 pit houses which ceramic rich backfilling's provided an in-depth look on the settlement development and chronology (Ramsl, 1995, 45).

Since the group identities of the occupants is the primary focus in this research, only the related settings will be detailed. For further information I refer to the already mentioned extensive study on the site by Peter Ramsl (1995). Prominently amongst such identity related contexts in Inzersdorf – Walpersdorf are three rectangular trenches with palisades or wattle fences, which alignment and positioning relate to LT A pit houses (Ramsl, 1995, 15; Trebsche, 2020d, 65). These structures are interpreted as farmsteads that are fortified or segregated and are comparable to similar fenced farmyards in Bohemia (cf. Smrž, 1996; Drda, Motyková and Rybová, 1999, i.a. 263) and in regard to delimitations inside settlements even in the Traisen Valley Hallstatt settlement site in Unterradlberg (Neugebauer, Blesl, Gattringer, et al., 1997, 463) . In contrary to the contemporary South German '*Herrenhöfe',* or rather square farmsteads, such fenced farmyards were far less elaborately fortified. It is even questionable if these barriers had a defensive character beyond symbolisation. Compared to individual farmsteads in the Valley, these fenced structures within Inzersdorf – Walpersdorf are significantly larger with an average side length of 50-60 m (Trebsche, 2020d, 65).

Based on this evidence, it is at least assumable that one group of inhabitants wanted to distinct or delimit themselves from another group or generally from the remaining settlements inhabitants. That being said, neither can we say which social group attempted this act of demarcation nor why. Be it to claim or highlight legal ownership over a plot of land for clan or kin, to emphasize the status of a group, as a half-hearted attempt of protection from small time criminals, or even more mundane as simple animal pens, either way, the archaeological context suggest that these enclosures did not last long, or in part changed regularly. This evidence could suggest a concomitant change of social structures (Ramsl, 1995; Trebsche, 2020d, 66).

Any further deduction on potential group identities in Inzersdorf – Walpersdorf can only be attempted through objects that serve as identity markers (cf. 8.4). Albeit such correlations should remain speculative without any quantitative analysis as done with the settlement cemetery, such objects can assist in the final interpretation of the clusters. For instance, are items as wheel turned '*Vekerzug*' ware and '*Geriefte Drehscheibenkeramik*' (Grooved Wheel Turned Ware) a further clue for a local elite that expressed their class identity (Ramsl, 1995, 27 and 48-50). These characteristic pottery variants relate to central settlements, or 'princely seats' (cf. 7.2.2.1) in the East and West, and at the very least indicate a trading network between these power seats. Several findings, such as loom weights and spindle whorls, pieces of crystalline graphite as well as fragments of crucibles, suggest deliberate

production of textiles, pottery, and processing of iron and non-ferrous metal (Ramsl, 1995, 29 and 42-43; Trebsche, 2020d, 66). This consequently can be a sign of an identity of occupation, which often gets neglected as an aspect of class identity, as much as for gender identity, on account of its intersectional relation to specific occupational groups (cf. 6.1.6). Even hints towards a possible religious group identity can be found, in form of a perforated boar jaw and a semifinished skull charm, as well as settlement burials of a neonate and a foetus (Ramsl, 1995, 51-52). Leaving speculations aside, such findings and contexts present in some measures that even rural settlements or larger villages such as Inzersdorf – Walpersdorf show clear signs of an interconnected web of group identities and resulting social hierarchies, that interact in various ways with their spatial and social reality.

5.2.2 The Social Structure of the Late Hallstatt and Early La Tène World

The concept of a homogenous 'La Tène Culture' along with uniform social structure, that spread from Spain to Anatolia, came under attack and reformed to an understanding that such a thing never existed. This complex scientific debate consists of many conceptional layers, such as definitions of cultures or ethnic identity (cf. Hansen, 2007; Karl, 2012), as much as contemporary (cf. Meskell, 2002) and past (cf. Legendre, Olivier, Schnitzler, et al., 2007) political issues that directly relate into any interpretation of La Tène social structures. The quintessence of this revaluation of 'Celts' and their social structure, is the shift away from a perceived uniformity.

Social structures are not a static concept. More so considering that the system and its agents inherently interact with living space, social hierarchies, group identities, as much as they are subjects of internal and external causalities (Nakoinz, 2013c; Rebay-Salisbury, 2016a; Nakoinz and Lüth, 2018). Accordingly, it can, for instance, be argued that Late La Tène social structures, are less comparable with those communities in Early La Tène then the latter's direct predecessors of HA D3. Among many reasons, the apparent being the long lasting impact of dominant Mediterranean cultures, particularly Rome (cf. Ramsl, 2020a, 18). There are many more relational aspects, besides diffusion or the passage of time, that showcase the unfixed nature of social structures. This should not imply that fundamental, related structures didn't exist, but it should be expected that these structures could have manifested very differently in each regional variation (cf. Fernández-Götz, 2014, 47; Nakoinz and Lüth, 2018).

Such a fundamental structure was defined for La Tène period in general by Manuel Fernández-Götz (2014, 41) as a hierarchical ascending structure beginning from households, extended family groups, sub-ethnic communities and finally ethnic communities. Outside of central settlements, the majority of communities existed within individual or networks of farmsteads and small villages, much like the Traisen Valley settlements (Neugebauer, 1992, 47; Ramsl, 1995, 48). The core unit was a kin group, household or *familia*. In essence a variation of a family that incorporated the core family along with distant relatives, clients, slaves, and other associates. Consequently, a number of households

constitute themselves to an extended family network (Fernández-Götz, 2014, 48-49, 50, fig. 3.5; Rebay-Salisbury, 2016a, 50-51; Ramsl, 2020a, 19). This underlying base structure represented the living reality and social environment of the majority of individuals (Earle and Kristiansen, 2010, 4; Fernández-Götz, 2014, 49). Most importantly, these extended families bury their members in communal cemeteries, according to a mixture of their local and supra traditions (Ramsl, 2020a, 19). Rendering them as the creators of the data applied for this method and their specific regional social norm as the research question.

The next structural level are sub-ethnic communities. This terminology does not imply traditional ethnic definitions, but rather a wider network of regional communities that share subjectively perceived communalities such as i.a., language, material traditions or history (cf. 6.1.2 for ethnic identity; also: Shennan, 1989, 14; Hall, 2002, 9; Smith, 2008; Fernández-Götz, 2014, 18). Other terms for this social structural level are tribes, chiefdoms or later external definitions as then Roman *pagi* or *civitas* (Fernández-Götz, 2014, 52-54; Ramsl, 2020a, 20). Disregarding the fuzziness and misuse of terms like tribes and western centric, often racist connotations that came with them in the past (cf. chapter 6.2; also: Sahlins, 1968; Renfrew, 1982, 1-5; Fernández-Götz, 2014-23, 52; Draems, 2021), in essence these are regional ethnic identities. Lastly, ethnic communities, that function definition wise similar to sub-ethnic communities, but implicate interregional communalities as much as formations of tribal- and city states, such as the late Hallstatt '*Fürstensitze*' or the 'Gallic' *civitas* as coined by Caesar (Fernández-Götz, 2014, 57). This ethnic definition is even more constructed as sub-ethnic groups as they can be based on mainly elite carried 'ethnic networks' or even endogenously defined 'ethnic categories' (cf. 6.1.2.1; also: Smith, 2008). It is this social structural category that most often are referenced to in ancient sources and materialize in form of tribal names, such as Helvitii, tribal states as the Italian Umbri or Samnites, and even Greek *poleis* (cf. Collis, 2007; Fernández-Götz, 2014, 56-63).

These social structural categories are primarily a tool. They are a way to understand the Valley's role within the greater Central European communication and trade network. This was done by Peter Ramsl (2020b, 368; 2020a, 19-20), when he applied the four-tiered social structure model to the Traisen Valley. Aside from the extended family groups, or 'costumegroups' (Ramsl, 2020a, 19, fig. 5), he further defined their position within their regional and transregional level. On a regional level, the Traisen Valley is subsumed within what Peter Ramsl (2020b, 369, fig. 1) coined as the 'North-Eastern Austrian Group' or 'NAG' and geographically consists of Lower Austria and northern Burgenland. The Traisen Valleys closest evident regional material similarities and connection lays within the Leithagebirge region. Both of their shared features are more over comparable with the Hungarian Sopron region, the Slovakian Vah area and the remaining Northeast of Lower Austria (Ramsl, 2020a; Ramsl, 2020b). These

connections are archaeologically evident by i.a., identical ceramic stamps that indicate travelling seasonal craftsmen (Zeiler, Ramsl, Jerem, et al., 2010; Ramsl, 2011, fig. 173).

Beyond sub-ethnic communities, these categories present a wide and somewhat vague range of possibilities in how social structures eventually manifest in extended families and their cemeteries. In conjunction with the aforementioned continuous nature of social structures, this brings issues and possibilities for any research on hierarchies and group identities on a regional level like the Traisen Valley. On the one hand, if supported by a scientific method, we might be able to infer general social structural tendencies from the macro level. On the other hand, should any interpretation on intangible details, such as specific form of government be retained, the researcher must maintain a constant awareness of generalisation. This is well exemplified, first, by the inclusion of contemporary interregional social structures that surrounded the Traisen Valley as a deduction tool for understanding the potential social structure of the Valleys extended family networks, second, within the innate scientific debate surrounding these interregional social models. Particularly in regard to the '*Fürstensitze'* model, or rather its reinterpretation, that, considering the interconnected character of the Valley, must have impacted the communities that lived along the River Traisen.

5.2.2.1 Revision of the '*Fürstensitz'* Model and Western Centralisation Processes

The terms 'princely seats' (*'Fürstensitze')*, and 'princely burials' ('*Fürstengräber')*, originally introduced by Wolfgang Kimmig (1969), in essence, describe a peculiar phenomenon of strong social differentiation during the late Hallstatt period that led to the emergence of strong elites. Notwithstanding regionally and chronologically differences, these elites generally manifest via rich burials, often fortified proto-urban power seats or general tendencies of centralisation and import goods (Egg, 1996; Rychly, 2017). These central settlements remain specifically a focal point in West Hallstatt research traditions, as in some cases, they did amount to impressive dimension, with the Heuneburg consisting of 100 ha during its mudbrick phase, or Bourges with several 100 ha, both being estimated to inhabit thousands of people (Fernández-Götz and Krausse, 2015).

Along with these terminologies, Kimmig (1969; 1983) proposed a social structural model based on these *'*princely seats', describing a particularly stratified society with a powerful elite at the top. This model was consequently expanded (i.a.: Zürn, 1970; Härke, 1979), heavily criticized (i.a.: Müller-Scheeßel, 2006; Eggert, 2013, 32; Nakoinz and Lüth, 2018), and modified (i.a.: Pare, 1989; Fernández-Götz and Krausse, 2015) up until today. The criticis, primarily imply a vast oversimplification and disregard towards the complexity of iron age societies, as much as an overly rigid deduction leading from rich graves to social hierarchies and ends with princes and kings (Nakoinz and Lüth, 2018). Consequent reactions suggested a flexibility of potential political systems, (Krausse, 1996; Schier, 1998; Burmeister, 2000; Knüsel, 2002; Thurston, 2010), away from the fixation on an inflexible pseudo feudal

system and sometimes harsh criticism towards a misjudged equation of political hierarchies and political centralism (Thurston, 2010; Nakoinz and Lüth, 2018, 93).

Although it is not implausible that some 'princely seats' could have functioned exactly as proposed in Kimmigs model, it is similarly plausible that neighbouring central sites utilized other political systems or social structures. An abundance of recent evidence and corresponding regional studies on these sites (cf., i.a.: Nakoinz, 2013b; Nakoinz, 2014; Fernández-Götz and Krausse, 2015; Fernández-Götz and Ralston, 2017; Nakoinz and Lüth, 2018), did for instance show that political and social structural complexity as much as demographic scales of Central European Early Iron Age societies have been "under- rather than overestimated", as pointed out by Dirk Krausse (2015, 483). Previously mentioned studies by Oliver Nakoinz (2013d; 2013a; 2013b; 2013c) attempted to reconstruct cultural space and spatial interaction of Early Iron Age sites in Baden-Württemberg via quantitative methods such as clustering analysis or variations of basic distant graphs for exploring spatial interaction and transport cost. The simplified and rudimentary take away from these studies was:

a. That these central settlements did possess only small territories of a maximal diameter of approx. 20 km, if at all (Nakoinz, 2013d, 96).
b. They were established at territorial communication interfaces that in all likelihood were controlled by these settlements, functioning as Gateways (Nakoinz, 2013d, 96).
c. That their basic spatial interaction reached a scope of approx. 200 km (Nakoinz, 2013b, 114).
d. The existence of a well-known, interconnected transportation system of at least 200 km, particularly in regard of the great rivers Danube, Rhein or Neckar (Nakoinz, 2013b, 112-114).

Such results do not only show how important reassessments of past social models are, but also the extend and supra-regional impact of Early Iron Age communication and transportation networks.

5.2.2.2 Late Hallstatt Centralisation Processes in the East

Centralisation processes with strong elites are as apparent in East as in the West. However, neither simultaneously nor equivalently, as many of the eastern central hilltop sites predate their western pendants and have their roots in the Bronze Age (Egg, 1996, 58-60). The overemphasise on western social structures within the debate surrounding the 'princely seat' model, is mainly reasoned on the discrepancy in regard to each state of research, that is far more extensive in the 'Western Hallstatt Zone'. There are multiple reasons for this. One is, in comparison to the West, meagrely documented and published past excavations. Another issue is that many Eastern burial contexts and goods were either destroyed, lost or severely damaged due to contemporary or modern grave robbing and even

more so by the very destructive nature of cremations (Egg, 1996, 55; Müller-Scheeßel, 2000, 37, 91; Rychly, 2017, 75).

Albeit substantial differences in between the 'Eastern Hallstatt Zone' and the West, recent studies and reassessments did show, e.g., indications for a downright settlement network in Slovenia (Gleirscher, 2006; Mele, 2012, 150). Reaching from Southern Styria to Western Croatia as early as HA B1/2 (Mele, 2012, 151-152). Even while similarities based on equivalent centralization processes are apparent, several of these sites do not fit into 'princely seat" schemas. For instance, the Styrian Burgstallkogel at Kleinklein, did not have a fortification, while the Slovenian site of Ormož had the prospering lowland satellite settlement Hajndl in direct proximity (Mele, 2012). In Moravia we find atypical regional variations, like 'princely homesteads' during HA D1 and D3 and "original manifestations of centralisation" such as the central sanctuary cave Býčí Skála that is accompanied by a princely burial (Golec and Mírová, 2020, 110, 122-125).

The Moravian study, importantly highlight that centralisation processes do not need the presence of a central hilltop site, or conversely is disproved by the absence of a single predefined factor. Rather are specific sites and their purpose reflections of certain social powers, whereas a hilltop site can highlight political centrality, a production sites or landscapes may signify economic centralisation, as much as sanctuaries and communal burial sites present religious and ideological power (Carneiro, 1981; Golec and Mírová, 2020, 125).

6 Burial Contexts and Identity

Every society has a specific set of standard burial practices on disposal that often follow a strict collection of rules. As archaeologist find these practices within the record, they consequently only represent a standardised version for a specific established chronological and spatial framework. Moreover, the physical remnants of these practices always are incomplete. Immaterial rituals such as songs are as absent as, in most cases, perishable material objects are. Past and contemporary grave robbings and openings even further distort any entirely authentic representation of the originally intended funerary ritual. Despite the absence of several pieces of information, there is still a substantial amount of archaeological evidence. Burial goods, rites, and erected structures all allow us to analyse at least a significant percentage of those standard burial practices.

The Traisen Valley consists of a large number of burial sites, that come in various sizes. Besides singular graves, as burials within settlements (cf. Trebsche, 2020a), as of now, there are small groups of graves e.g., Ossarn (22 graves), medium-sized cemeteries as Pottenbrunn (45 graves) or Oberndorf (40 graves) and large funerary grounds, most specifically Franzhausen with up to 170 Early Iron Age burials (Ramsl, 2020d). As, both, the addition of recent rescue excavation data in Oberndorf (Morschhauser, 2012;

Kultus and Kultus, 2021) and latest preliminary reports for Inzersdorf (Morschhauser and Pollak-Schmuck, 2021) showed, none of the cemetery sites used for this thesis are excavated to their full extend. This, as well as aerial photography do partially suggest that all three sites are potentially as extensive as Franzhausen. Which itself, together with Pottenbrunn, is the most thoroughly excavated funerary site in the Traisen Valley to this day (cf. 7.1.1; Ramsl, 2020d, 402).

As there is an already existing, well established literature for a large number of archaeological burial contexts in the Traisen Valley, these contexts will not be reintroduced besides a brief discussion on the Traisen Valley burial rites. For further detail the author intends to refer to that sizeable number of literatures. Among these are monographs on extensively investigated sites, such as Pottenbrunn (Ramsl, 2002), a sizeable number of consecutive excavation reports as with Inzersdorf (Neugebauer, 1996b; Raab, 2017), compendia (Ramsl, 2020d), book sections (Grömer and Ramsl, 2019) and conference proceedings (Ramsl, 2020b). A more comprehensive description of the specific burial contexts used for the clustering procedure will follow in chapter 9.5 data description.

The goal of this chapter is to discuss why burial contexts are the ideal data source for quantitative research on a complex topic like identity, as well as the limits and opportunities derived from its related theoretical body. Group identities innate complexity is difficult enough to comprehend or portray in a contemporary context. Yet, it still increases significantly if we attempt to understand past- and proto historic identities based only on archaeological sources. Besides extensively excavated settlement contexts [11] as e.g., the Heuneburg (cf. Fernández-Götz and Krausse, 2015), funerary contexts are the only reliable archaeological sources that allow plausible conjectures on group identities. At least if not analysed in isolation, but in larger numbers, and ideally in combination with scientific methods, such as strontium isotope analysis (cf. i.a.: Scheeres, 2014) or quantitative methods (Hausmair, 2015), as in this thesis. Individual identities are almost impossible to pinpoint purely based on a funerary context, simply because in most cases the individual does not decide how he or she is buried (cf. 8.1). Group identities on the other hand, can be traceable as patterns within the archaeological record.

This hypothesis is mainly based on three theoretical concepts: the sociological theory of 'habitus' (Bourdieu, 1979), the established body of archaeological theory on death and burial rite by Parker Pearson (2009) and the psychological concept of 'in- and out-group bias' (Tajfel, 1970; Tajfel and Turner, 1979). All three deal with questions of why and in which manner individuals and groups reflect their identity daily via material culture, and how we attempt to differentiate us from others at the same time (cf. Popa, 2018, 55-57). Also, these theories are all directly related to methodological

[11] Simply due to the sheer quantity of contexts that portray, i.a. living realities or religious and social spaces beyond social classes, which cumulative can allow conclusions on group identity aspects.

aspects. For this reason, will ‘in- and out-group bias’ be discussed ahead of its directly related methodological chapter dealing with the similarity algorithm in 10.2. The following subchapters focus on how identities are expressed in burial rites, 'habitus', along with a discussion on the contentious concept of ‘identity marker’ and lastly, how grave robbings and other grave openings are both a source of data distortion and additional external expression of identity.

6.1 Representation of Identity in Burials

There are few certainties in human existence that are as unavoidable and devastating as death. It carries intrinsic qualities such as fear, one’s own demise and the loss of others, as well as the sorrow for those left behind. Grief and the pre-stages of ritualized mourning are universal concepts are not only observable in human behaviour, but also in animal behaviour, e.g., as seen with elephants, chimpanzees or dolphins (Bekoff, 2000, 865-866). Human societies have developed a vast variety of cultural practices to cope with anxiety and grief of death, which are summarized under the terms ‘mortuary – ‘or ‘funerary practices’. Each community sustains these rituals and practices through traditional narratives that incorporate most, if not all, facets of their communal identities (Popa, 2018, 16).

Whereas religious and afterlife beliefs are naturally those group identity aspects that preserve and impact burial practices most apparently, social status, gender, ethnic identity, or age are all aspects that in some way or another affect the way a deceased is buried. These practices and representations of identity are in most cases institutionalized and ritualized. They help to accept a communal loss and depending on the level of social trauma and instability (cf. 5.2.3.1) an individual’s death brought upon his or her society, simultaneously, either symbolically or literally, re-enact social order (Hakenbeck, 2004, 41; Parker Pearson, 2009, 101; Popa, 2018, 16-17). This is crucial, because depending on the social status or importance of the deceased, there is a risk that such a death can disintegrate a community’s structure and consequently plunge it into chaos (cf. for large number historical succesion crises instigated by a ruling figures death: Luard, 1992; also: Popa, 2018, 16).

Burial rituals stabilize their society as they enact or re-enact social interrelationship of the mourners, the deceased, and the remaining attending community. In many cases these rituals are intrinsically structured, wherein every participant knows the course of events and their expected role, therefore bolstering the social equilibrium. Despite this structuring, funerary rituals are not an exact representation of a communities social roles and practices, but rather an idealized version, that allows a variety of distortions, since social relationships and afterlife beliefs merge (Parker Pearson, 2009, 102 and 112; Hausmair, 2015, 33-58; Popa, 2018, 17-18).

The participants of these rituals can generally be differentiated into the deceased itself, his or her family and the remaining community. All have expectations about the way the communal as well as

the individual identity of the dead and his or her 'capitals' (cf. 8.3) are enacted in the burial. These expectations can differ, compliment, or contradict each other. The deceased may have wished that his or her cultural and symbolic capital are highlighted in his burial representation, whereas his family and the remaining community rather prioritized the dead's social and economic capital (Brather, 2008, 153; Schreg, Zerres, Pantermehl, et al., 2013, 113-114; Ramsl, 2020a, 14-15).

A substantial representation of individual identity is by and large not traceable in most funerary records. This is in part because on an individual level, death is not only the perceived end of existence, but for the vast majority of individuals in history, also the actual ceasing of their agency. As Mike Parker Pearson (1993, 203) famously said: "the dead do not bury themselves", and although some individuals may enact wills or other arrangements in advance "the wishes of the deceased are not always followed". There is a variety of reasons why such wishes are ignored. One of these can be that a desired burial practice deviates from the social norm, as mentioned funerary practices are generally heavily ritualized. It could also be that the deceased never openly shared his or her personal defining identity aspects with his or her community.

As intangible as prehistoric afterlife beliefs and individual identities are, grave goods are one potential source. At the very least, we can assume that the vast majority of grave goods served a specific purpose. As much as the overall ritual, they serve as a coping mechanism for the mourners, possess an emotional connotation, and further incorporate relations to the past, present, and future (Härke, 2003, 118; Hausmair, 2015, 42). The dead's personal objects contain memories and thus connect to the past. The present is often reflected in objects that are demonstrations of power, whereas objects that should accompany the dead to the afterlife, as offerings or drinking vessels, are a representation of the future (Hausmair, 2015, 42-43). These categories intersect, are never determined, and are vastly mutable from community to community. But they illustrate the importance, variability, and inherent teleological nature of burial goods. It should also be mentioned that, despite the prevalence of religious overtones in burial rituals, it is quite probable that a minority of participants did not share or care about these components, even if the majority did. Lastly, since many objects may evoke biographical implications, no aspect of a rite the passage arguably reflects an individual's personal identity as well as his or her burial goods composition (Härke, 2003, 119; Hausmair, 2015, 43-44).

Regardless, by and large, there is no way to determine if any archaeological burial context accurately presents the deceased's identity. In reality, individual identities as portrayed in burials are likely an intangible amalgam of all participants', including the deceased, expected identity representations premised on standard practices. Thus, singular burials represent only one specific variation of that idealised social norm. Consequently, if a large number of these variations are statistically analysed within an appropriate context, a pattern representing a plausible interpretation of the approximate

idealised sum of group identities should become visible (Parker Pearson, 1993, 203; Popa, 2018, 18; Ramsl, 2020a, 14).

6.2 Burial Rites in the Early Iron Age Traisen Valley

It was only during HA D and the increase of Western Hallstatt influences when inhumation became more regular compared to priorly preferred cremations (Egg, 1996, 61; Rebay-Salisbury, 2016a, 63). This represents an underlying trend, that connects at least all transitional periods in the chronological limitations that both inhumations and cremations existed in almost all sites simultaneously but depending on the specific timeframe with different emphasis. In Pottenbrunn, e.g., the ratio for La Tène period burials is 25 inhumations and 12 cremations (Ramsl, 2002, 16). This is also noteworthy within another phenomenon, that are multiple burials within one grave. There are a number of multiple inhumations burials within the research area, among them e.g., a quadruple inhumation in grave 28/82 in Oberndorf, or the double cremation grave from Inzersdorf grave 282 (cf. Neugebauer, 1996b, 161, table 20).

There are, however, rare exceptions of multiple burials that incorporated both ritual types, as in Oberndorf grave 44/04, or as in Ossarn, grave 6/84 that contained an inhumation, two urns and an unseparated cremation (Ramsl, 2020d). Both inhumations and cremations should not be seen as two opposites. While it is very likely that both rituals also represented different variations of religious identities and afterlife beliefs, several stages of their accompanying rituals can coincide in many aspects (cf. Sørensen and Rebay, 2007, with an example from the Pitten cementary, Lower Austria.). On the other hand, are even different ritualisations of cremation, potential alterations in belief systems. No other burial rite, besides cremations and inhumation are verifiable in the Traisen Valley as of now. There is however a sound argument put forward by Peter Ramsl (2020d, 416), that completely empty graves and burials without human remains, which both can be found e.g., in Pottenbrunn, as well as single burials with two sets of weapons that have been found in neighbouring Lower Austrian sites as Au am Leithagebirge or Potzneusiedl, could indicate Cenotaphs.

While both burial traditions always occurred parallelly within the chronological timeframe of this thesis, inhumation still remained the most common burial practice (Ramsl, 2020d, 415). There are three features that differentiated inhumation burials, the orientation and posture of the deceased body, and the number of burials. As already mentioned above, are there various combinations of multiple burials. This is particularly evident with inhumations. In all three funerary sites used as data within this thesis alone, are we able to locate at least six double inhumation burials and the already mentioned quadruple burial (OBD/28/04, cf. fig. 20). Multiple burials occur further in mixtures of same or different sexes, adults with children, and as stated above, even distinct burial rites. A variation of

that phenomenon are additional burials. In such cases, graves are reopened to add another burial, in many cases children as in Pottenbrunn grave 520 (Ramsl, 2002, table 12; Ramsl, 2020d, 412).

Another layer of ritualised funerary traditions are all aspects that incorporate a graves architecture. Among these are the dimensions, form and general inner structures of the grave shaft and all outer constructions, such as the, for this timeframe characteristic, surrounding systems (Ramsl, 2020d, 403-410). The term 'surroundings' is a loose and neutral translation that describes ditches that in most cases surround one, or at times even several graves, as with graves 284 and 285 in Inzersdorf (Neugebauer, 1996b, 115, table 2). These ditches are up to 0,7 m deep, 1 m wite and are often interpreted as '*Grabgärten*' [12]. They come in various shapes, such as roughly circular, that have an approx. diameter of 7 – 15 m, as well as almost rectangular or even square with an approx. side length of 6-15 cm. Although single ditches remain the standard variation, in certain cases they also come in pairs (cf. for single and double row ditch in Pottenbrunn: Ramsl, 2002, 155, plan of all features; Ramsl, 2020d, 409). Similarly, are some ditches constructed to be closed, whereas others come with entrances. It is plausibly argued that these structures could have been a central part of, and location for, the rite of passage, or at the very least served in a multifunctional way before, during, and after the burial rite (cf. for a possible Cenotaph in Pottenbrunn: Ramsl, 2002, 117–119; Ramsl, 2020d, 409 and 422).

One issue within the data applied for this thesis, is the lack of burial mounds in the Traisen Valley from Early La Tène onwards. This absence was not limited to the research area, considering that Jan Filip (1956, 65) defined the LT B period and the 'Celtic Expansion' as the '*Flachgräberhorizont'*, hence a period defined by flat graves (Ramsl, 2020d, 403). This notion was critically revaluated in subsequent decades and today we know that tumuli were still erected, as several examples of excavated LT A – LT B burial mounds in Lower Austria, as Rassing an der Perschling (Preinfalk, 2005), and Katzelsdorf (Urban, Teschler-Nicola and Schultz, 1985) confirmed. It consequently seems likely that burial mounds were far more common in the Early Iron Age Traisen Valley as previously assumed. However, as Peter Ramsl (2020d, 406) pointed out, these tumuli were most likely lost to erosion and farming. A concern that cannot be ruled out for all three sites used as case studies.

Any such features are as much a reflection of the communities and families idealised perceived identity of the deceased as the ritual and burial goods. Traditionally, even more so, since concepts as 'neo-evolutionary sequence of stages of social development' (cf. Binford, 1968; Tainter, 1978) did consider labour-intensive structures as burial mounds or surroundings as a quantifiable collective effort of

[12] For a lack of a proper translations, 'Grabgärten' is a common German term for gardens that are an architectural component of a grave.

energy and resources and therefore a reflection of the deceased social status (Babić, 2005, 72). As debated in 6.3.4, status should not be simply equated with economic power or 'capital', as it is but one facet of an individual's social class identity. Having said this, the base argument, that any noticeable resource expenditure and energy effort put into a burial rite highlights the deceases social status, still remains feasible.

6.3 'Habitus', 'Social Capital' or How Identity Manifest within Material Culture

The sociological concepts of 'habitus' formulated by Norbert Elias (1987) and Pierre Bourdieu (1977b) are essential and recurring aspects for this thesis and its methodology. It also remains an essential concept to understand societies, individual and group identities, as well as the importance of daily rituals and the social essence of material objects. In simple terms, the 'habitus' connects the individual with the community. It summarizes how an individual reacts or perceives the social world it inhabits, manifests in our social praxis, and reflects its status. On the other hand, it is a complex system that incorporates perceptual, behaviour- and thinking patterns that influences every individual action and conduct. 'Habitus' is instigated by an individual's social status, cultural and social background, as well as living conditions, biography, and identity. Specifically, Bourdieu defined 'habitus' as the sum of an individual's demeanour, that features i.a. language, lifestyle, taste, or dress. 'Habitus' thereby determines a person's social conduct, as much as the expression of that person's social status reflects his or her 'symbolic capital' (Bourdieu, 1977b; Babić, 2005; Schreg, Zerres, Pantermehl, et al., 2013, 101-103).

This supposed determinism was often part of an essential criticism towards the concept of 'habitus' (Rieger-Ladich, 2005). Especially, in the traditional German '*Hegelschen'* historiography that deemed history to be written by the genius of the individual, it was considered as overly determining. Others, like Rainer Schreg, Zerres, Pantermehl, et al. (2013, 101) or Manuel Fernández-Götz (2014, 15) consider it instead as a link, that incorporates both individual agency and social norms. A compromise between 'subjectivism' and 'objectivism'. This is well represented by the notion of 'doxa', refined by Bourdieu (1977b), as the unconditional acceptance of the social norm, its set of beliefs and the incorporated social expectations. The 'doxa' can be recognized as the natural order and can further lead to the perception that suppression may be accepted by those that are subjugated. Nevertheless, this seemingly determined acceptance can be challenged or questioned from within, as much as from outside. At that point 'doxa' transforms into both deviating and traditional concepts, or belief systems, that establish themselves (Fernández-Götz, 2014, 38).

Not only does 'habitus' reflect social status, but it also affects it. Passed down perceptual and action schemata establish certain 'habitus' in a variety of social realities. These schemata enforce, either intentionally or unintentionally, differences and commonalities within social groups, thus formatting

and reinforcing group identity, social stratigraphy, and inequality (Bourdieu, 1987; Liebsch, 2008, 74; Schreg, Zerres, Pantermehl, et al., 2013, 101-103). Dynamics exemplified by the already debated 'masculine' and 'sexual habitus' (cf. 6.1.1.2; also: Bourdieu, 1997; Connell, Meuser and Müller, 2014, 13-14). Bourdieu (1979) established his theories of social stratification by investigating his contemporary French society based on aesthetic taste. He perceived that certain 'habitus', summarized as 'capital', defines, and characterises our social rank. Not in itself, but once an individual communicates its social rank to the community. This 'capital' is defined by Bourdieu (1986) into 'economic –', 'social –', and 'cultural capital'. 'Economic – ', and 'social capital' incorporate material wealth and social networks. 'Cultural capital' is specified by the level of education and knowledge. Bourdieu (1986, 245-246) further differentiates in between "incorporated" and an "objectified cultural capital". The first one is classified as education, that today is expressed by academic titles, while the latter describes the availability of books and other practical means for education. In presenting our forms of 'symbolic capital' we reflect our social status, which consequently makes our 'habitus' dependent on our social class (Babić, 2005; Schreg, Zerres, Pantermehl, et al., 2013, 103-104).

As Bourdieu considers 'habitus' as the sum of our lifestyle e.g., our aesthetic taste, our language, dress, or simply our everyday practice, it is constantly reconstructed and reinforced, in the same way our identities are. Moreover, both identity and 'habitus' manifest in praxis and subsequently in material representation of what is defined as a facilitated and subjective social norm (Tilley, 2006; Schreg, Zerres, Pantermehl, et al., 2013, 105-107; Rebay-Salisbury, 2016a, 33-34; Popa, 2018, 54). This link between theory of practice, identity formations and their imprint on material culture, is what made Bourdieu's concepts interesting for archaeologists past and present, as well as for this thesis' specific methodology.

6.4 Identity Markers

The term 'identity marker' is sometimes used to describe an object's inherent quality to highlight its affiliation towards certain group identities (cf. i.a. Linde-Laursen, 1993; Meskell, 2002, 283). Following Bourdieu's (cf. 8.3) concepts, almost all material objects would to some degree be identity markers. Albeit, this is true only to some extent, the issue lies within the stated relativity that is evident in many aspects of how identity expresses itself within material culture.

We must, for instance, again be as much aware that any interpretation based solely on archaeological data will miss immaterial identity indicators, as of presentism and overdetermination of individual aspects of hybrid identities. We must be further cautious of overemphasising material identity markers without contextual information, or of disregarding, the indeterminate character of identity markers, which are constantly redefined over time within group or individual identities (Hall, 1997; Jones, 1997;

Brather, 2004). Beyond those sets of issues, 'identity marker' also convey an alleged contradiction if combined with statistical methods, as these markers not only are:

a. subjective if interpreted,
b. relative in their impact on past and present groups and individuals,
c. undetermined,
d. yet, in many cases also proportionally statistically evident.

This supposed ambiguity between quantitative tendencies and inherent relativity led to a research history full of archaeological misinterpretations towards identity. Past researchers often recognised that 'statistical significance' of recurring combinations of basic identities and certain objects to reinforce their own contemporary biases. Whereas relativity was neglected to present interpretations as a determined reality. This is best exemplified by the concepts of 'archaeological gender' and 'ethnic markers', which were already debated in 8.3.1 and 8.3.2. 'Archaeological gender' to this day remains an archaeological tool to determine sex and/or gender of buried individuals purely based on their burial good composition, without anthropological examination (Díaz-Andreu, Lucy, Babić, et al., 2005, 3 and 22; Ramsl, 2020a).

As a tool, applying 'identity marker, is not intrinsically 'bad'. Anthropological enquiries are expensive and therefore in many cases unavailable. It is rather the misinterpretation of statistical data that can lead to essential misconceptions. In Oberndorf, e.g., we found 12 presumable weapons graves, 10 of them were anthropologically determined as definitive male individuals, whereas two female burials were either likely or certainly buried with weapons. This tendency follows the larger body of evidence that most Early Iron Age weapon burials were male individuals (cf. i.a.: Scheeres, Knipper, Hauschild, et al., 2013; Scheeres, Knipper, Hauschild, et al., 2014; Beilke-Voigt, 2020, 19). The emphasis here lies on 'most' though, as even a substantial tendency does not negate a relevant number of exceptions. As we know from previous examples (i.a.: Spindler, 1983; Gardela, 2013; Hedenstierna-Jonson, Kjellström, Zachrisson, et al., 2017), archaeological interpretations of gender roles were often deeply rooted in anthropocentric interpretation and predetermined gender roles. These biases and stereotypes, specifically in relation to weaponry or spindle whorls (Grömer, 2004, 181), consequently led to a universalisation of statistical tendencies, that either misinterpreted or almost completely ignored exceptions (Jud, 2006, 91), such as the famous lady of Vix (Spindler, 1983, 108; Arnold, 1991, 370; Jud, 2006, 92) and therefore falsified any further interpretation.

Ethnic interpretations suffer from similar issues, many of which have been already extensively debated in chapter 6.1.2. Besides past overemphasis on race or ethnicity (cf. i.a.: Bierbrauer, 2004), there is also the dialectic nature of ethnicity. Ethnicity exists as an ideology, experienced as a subjective identity of past societies, but also as a practice, recovered as objective sociocultural features by

archaeologists. We have to consider that different ethnic communities, purposefully or not, distributed their material culture in different ways. While some ethnic communities might be well represented by a discontinuation in the distribution of their material representation, other groups may represent their ethnicity primarily in non-materialistic ways or choose strategies of assimilation or integration (Hodder, 1982, 186-187).

Both examples should highlight the relativity of archaeological identity markers, that is, as much as, if not more, inherent as their reflection of identity. Despite this, the principle in itself that some object categories do highlight tendencies of group identity affiliations remains plausible and statistically verifiable. That being said, identity markers should only be methodically implicated if they are not investigated isolated, but within a large body of data and context, as well as if one is aware of their fragmentary nature and intrinsic relation with 'intersectionality' or 'hybrid identity'. Understanding the intersecting nature of group identities further helps to understand how institutional provisions, social practices, and power dynamics are formatted, therefore making it a vital tool for understanding social dynamics hidden within an accumulation of identity markers (Hodder, 1982; Voss, 2008, 4; Fernández-Götz, 2014, 14; Popa, 2018, 56-57).

It is reasonable to assume that an Early Iron Age male individual would show different ways to present his identity, compared to a woman contemporary to him, even if they are from the same ethnic community. At the same time, if they are both part of the same elite, they would likely show common identity markers to differentiate themselves from lower class members of the same group. Understanding such possibilities in group identity intersections is essential, to comprehend the ways in which societies institutionalise some of these identity groups and their material manifestations.

Nevertheless, 'identity marker' remains an inaccurate tool to represent a community's cumulative identity due to their discussed relativity and imprecise nature. This is why within this thesis; identity markers are not used to determine group identities directly. Based on the 'theory of practice' and 'habitus', their practical application is rather determined by their inherent quality of identity representation itself, as all burial goods data is collected in a hierarchical system that highlights their functionality over aspects of typology (cf. 9.4). Only after the final clusters were conceived, visualized, and interpreted more explicit correlations of 'identity markers' and certain group identities evident in the data are debated if plausible.

6.5 Grave Robbings and Grave Openings

Finally, there is a need to discuss how direct, contemporary post burial interferences are both a potential 'identity marker' of the buried individual, yet also a potential feature of data distortion. Burial deposits that display signs of contemporary disturbances are a common encounter in archaeological grave contexts. Archaeologists can significantly narrow down the original intents for post-depositional

relations, but seldom with full certainty. One reason for that is that motives for openings, even within the same cemetery, are both, often fundamentally different, varying in itself, yet still not mutually exclusive. Spanning from negatively connoted practices such as profit oriented grave robbing, or deliberate emblematic political or religious grave desecration, to a variety of socially tolerated or desired practices, like ritual based reopenings and/or manipulations (Spatzier, 2007, 242; Lamm, 2015, 165-166; Aspöck, Klevnäs and Müller-Scheeßel, 2020). If we stick to these broad categories, archaeologists can distinguish quite accurately between distinct post-depositional processes. Any such deduction is based on an understanding of several contextual aspects, experienced during any grave's excavation. Among the most important are:

1) Identified discrepancies between analogical undisturbed graves that represent the contextual burial norm and disturbed ones, such as:
    a) the inner grave structure, or
    b) the standard ratio for burial goods and precious metals (e.g., cf. for Franzhausen I: Spatzier, 2007, 240-243).
2) Observable post-burial intrusions within a grave context, like:
    a) how and when a grave was reopened,
    b) how and if an opened grave was refilled,
    c) in what way a body decomposed and
    d) if any kind of manipulation left traces (Aspöck, Klevnäs and Müller-Scheeßel, 2020, 8-14).

Depending on the quality of the excavation documentation and method, as well as on the availability of archaeothanatological, anthropological and additional quantitative analyses, exceptionally high-resolution results can be achieved. Best exemplified by century long investigation on the Early Bronze Age cemetery, Franzhausen I (cf. Neugebauer, 1991; 1994b; Sprenger, 1999; Spatzier, 2007; Keller, 2013).

6.5.1 Post-Depositional Interaction in the Iron Age Traisen Valley

Although grave openings for the Early Iron Age Traisen Valley are not as excessively researched as their ancestors in Franzhausen I, there are still a substantial number of already analysed disturbed burial contexts. These, along with corresponding related frameworks, like the Leithagebirge or Morava, allow in-depth differentiations and further investigations (Ramsl, 2020d, 419-421).

Ritual openings, as previously stated, can be traced by several observations. Particularly noteworthy are context related indicators that reveal several ritual stages. Be it for the initial burial rite or later reopenings for secondary and/or additional burials. One such indicator is a specific occurrence of where ceramic vessels are placed, below, or directly above a deceased person's remains. Variations of this can be found in Pottenbrunn (cf. Ramsl, 2002, fig. 34-35, 47; table 41 and 55), but also in

cemeteries in Bohemia (Sankot, 2003), Slovakia (Bujna, 1998) and Hungary (Hellebrandt, 2012). There are multiple causalities that lead to such unusual vessel localization. For instance, in Pottenbrunn, grave 574 (Ramsl, 2002, fig. 47), a vessel was found upside down, exactly on the deceased's right hand, suggesting that this vessel could have been placed on a wooden coffin and only ended up at its final resting place after the coffin decayed (Ramsl, 2020d). This is only one example for this phenomenon. Other burials in Pottenbrunn, e.g., grave 400 and 68 (Ramsl, 2002, fig. 34-35; table 41), exhibited considerably more complex sequences, that indicate reopenings for additional burials and potential pre-stages of the initial burial rites.

Robbings are more easily retraceable, as they often have followed a certain procedure, like purposefully targeting those areas of a burial, where they knew precious objects were placed, e.g., the shoulder or hip area. In other cases, we can even determine specific sequences of the robbing event. In Pottenbrunn (Ramsl, 2002; Ramsl, 2020d, 419-420), e.g., three distinct moments of when a grave was opened are observable. Three graves had been opened in very close time proximity of the initial burial before the deceased body decomposed. Three further burials were opened after the decomposition began and the bodies were no longer fully articulated. Lastly, six graves had been opened at the time when the buried were already fully skeletonized. Another notable observation from Pottenbrunn comes from grave 54. The fact, that the skeleton was completely disturbed, except for the head and shoulder area, just where a precious silver object would have been, suggesting a robbing that was either seemingly interrupted or in short notice (Ramsl, 2002, 22; also table 39).

6.5.2 Grave Opening Motives as Identity Marker?

Finally, the question remains, if an attested original intent for any grave opening could be considered as an 'identity marker' for the buried individual. To answer this question, we must first consider if motives can even be verifiable to the point that allow any implications on that scale. We can assume that in most contemporary cases of post-depositional interactions that the individual's grave was deliberately targeted, e.g., either for its valuable burial goods if it was a robbing, or as a sign of veneration if the intent was ritualistic. 'Negative' motives, as robbings and desecrations, are logically comprehensible and somewhat recurring themes that are evident from the Neolithic Era to even present-day Austria (Lamm, 2015, 163-134; Aspöck, Klevnäs and Müller-Scheeßel, 2020, 7) [13]. Even though greed, or need, are likely the most reasonable and common motives, an alternative explanation should considere if 'need' at least can result in communally tolerated grave 'robbing'. This was first suggested by Bernhard Hänsel and Nándor Kalicz (1986, 50-52), as they considered that, at least, in

[13] Lamm (2015), states that grave robbery is still not uncommon in modern day Austria and highlights the newsworthy abduction of the remains and coffin of Friedrich Karl Flick in 2008.

Middle Bronze Age Central Europe a community or family may have deemed it appropriate to reopen their deceased's grave after a certain time interval, most likely after the decomposition, to salvage valuable objects and resources (cf. Spatzier, 2007, 243; Aspöck, Klevnäs and Müller-Scheeßel, 2020, 5).

Ritualistic practices, on the other hand, are often less coherent, because the majority of motivations are based on unknown belief systems. The most conceivable among these ritualized motives are those that are genuine elements of multistage funerary rites, like secondary burials and particularly reopening for additional burials. Such consecutive burials are also fairly recurring practices throughout history and pre-history. The majority of the time, additional burials take place in short succession following the initial one, but still after the first buried individual decomposed (Aspöck, Klevnäs and Müller-Scheeßel, 2020, 15-17). A notable exception to this is the Iron Age Dürrnberg cemetery in Salzburg (cf. i.a.: Pauli, 1978, 59-65; Neugebauer, 1981; Zeller, 2001, 166-178; Wendling and Wiltschke-Schrotta, 2015, 157-161, 273–274 and 311; Wendling, 2020), which is both temporally and geographically close to the research area of this thesis.

Here a number of multiple burials were reopened at a time when some of the initial bodies were still articulated. The Dürrnberg site shows a large number of similar reopenings, and thanks to the high-resolution documentation, multi-storey funeral constructions could be broken down chronologically, and consequently allow a multi-generational analysis (cf. Wendling, 2020, 170, fig. 8.10). The Dürrnberg cemetery portrays an interactive bond between the community and their ancestors, leading Holger Wendling (2020, 171-172) to suggest an ancestral cult that intended a "physical network between this and the nether world". There are a number of other ritualistic motives besides the worship and veneration of ancestors and other important figures. Fairly popular are ritual reopenings to battle, re-kill or stop the resurgence of revenants, or any other variations of the more haunting kind of dead (Aspöck, Klevnäs and Müller-Scheeßel, 2020, 18-19). A variation of that practice, passed down from Norse text as *haugbrot,* and has even functioned as a rite of passage for young adults (Lamm, 2015, 179-181).

In conclusion, the evidence suggests that signs of any post-depositional interactions are indeed, albeit very rough, indicators for the deceased's identity, perceived by those that reopen the grave. Depending on the period of time between the original burial rite and its reopening, this perceived identity is less an already biased perception by the grieving family, but an even more romanticized version of later generations. That being said, if applied only as a partial or minor aspect of any interpretation of group identity participation, a broad categorisation that considers ritual openings as a sign for a religious, ethnic or kinship group identity, and grave robbings or desecrations as markers for class identities, can be plausibly but still cautiously contemplated.

7 Data

As the last chapters bestowed context and agency upon the burials used in this master thesis, now we will look upon them again as data. Methodologically, a practical kind of data, as burials have two mayor upsides in regard to both statistical modelling and investigating past identities. First, the theoretical correlation between funerary rituals (cf. 8.1) and group identities (cf. 6), since such rituals convey a glimpse of a communities' afterlife beliefs, as well as an idolised representation of both, their group identities, and the deceased as seen from the community (Pearson, 1982, 112; Hausmair, 2015, 33-58).

The second upside is a very practical one, as cemeteries are one of the most published archaeological areas, often containing vast numbers of scientifically processed burials. To that effect burial contexts are the ideal source for researching past identities via statistical means. There are still specific concerns that must be considered. Data quality and issues are one particular aspect within a quantitative methodology. Others such as theoretical circular reasoning, as with past archaeologist studies that overdetermined ethnicity or the economic value of burial goods, as much as limitations and issues within the software should also always be kept in mind (Popa, 2018, 18-19, 24-25). The reasoning for the broad holistic fundament, consisting of theory and context, was in actuality based to tackle such theoretical issues. Especially as aspects of the methodology are subjective interventions by the researcher. Similarly, the software aspect was solved by asking for a helping and advising hand from an expert in computer science and programming. The Data issues on the other hand are very much dependent on the available data.

7.1 Reason for Data Selection

The most practical explanation for the alleged small sample size is that this study has the inherent limitation of being a master's thesis. A larger set of data, either including all researched Early Iron Age cemeteries in the Traisen Valley or focusing on one of the larger, well-documented sites such as Pottenbrunn with 45 burials (Ramsl, 2002), or Franzhausen with up to 170 documented La Tène burials (Ramsl, 2020d), would have been the methodically optimal choice. However, it also would have blown this master's thesis out of proportion. Thus, early on, the decision was made to limit this study to the two unpublished cemeteries of Oberndorf and Ossarn, as well as the later addition of Inzersdorf. This was done first to deliberately evaluate if this method worked on a smaller set of data, which is often the reality with partially excavated cemetery sites. Secondly, this thesis should also be considered a test run for future attempts, potentially including all available funerary data from the valley.

Hence, not all the data applied for this master's thesis was specifically chosen to be used with this methodology. It was noticeable from the very beginning that the relatively small number of burials, or

samples, within each individual cemetery were not ideal for clustering procedures. Oberndorf and Ossarn, in particular, were chosen for a variety of other reasons. First, within the richly published research area that is the Traisen Valley, Oberndorf and Ossarn have not seen a proper publication. As a publication concerning this area and timeframe was in the works by my supervisor, Peter Ramsl even before I presented him with my research plan for this thesis, it seemed plausible that those two sights were chosen, and that this thesis would bring reasonable results. Second, while the issue with the small sample size was obvious from the start, so were the well-processed catalogues containing highly detailed documentation for each individual burial, as done by Peter Ramsl (unpublished) in the cases of Oberndorf and Ossarn.

Inzersdorf was added late into the process, as its documentation and scientific processing were similarly elaborate as those of Oberndorf or Ossarn, and published by Neugebauer (1996b). The blatantly small number of only 13 graves in Inzersdorf came with its own issues, since this number was far below the threshold where a computed clustering procedure was necessary. The main approach to tackling the low sample size issue came with the already stated decision to add a fourth clustering procedure that incorporates all available burial data. This was only possible because all three cemeteries and their settlements existed at the same time and in close proximity, and the data quality was comparable. These cumulative clusters not only allowed for the validation and control of the respective singular cluster groups of the respective cemeteries but also allowed for a single clustering process with a reasonable sample size and attribute ratio.

7.2 Data Quality and Issues

The initial data quality is an essential component of any statistical application. Since the emergence of data science as an interdisciplinary scientific field, quantitative applications as clustering analysis became an integral part of numerous scientific and economic disciplines to group data with distinct qualities (Bacher, Pöge and Wenzig, 2010; Cao, 2018). It is perhaps for this range of applications and consequent variety in data sources that there is no definitive rule for how large or small a sample size necessary for cluster analysis must be. Despite this, at least in the fields of Business or Social and Behavioural Sciences, the number of samples is expected to be correlating with the number of variables or attributes. (Dolnicar, 2002). It is important to note that these requirements are both depended on the subject, the applied clustering methods, the data that is available, the specific case study and research question. In case of this thesis, and any similar attempt of statistical modelling with burial data, samples are burial contexts or graves, whereas variables or attributes would be every further aspect used by the similarity algorithm, such as burial rituals or goods and any other contextual information's.

7.2.1 Low Sample Size, High Resolution of Attributes

This leads to the issue that, on paper, a proper set of burial data would consist of up to approx. 300 graves, documented and processed to the point that a similarly high number of context-related details are evident for each of these grave. As most archaeologists are aware, the combination of large quantities of meticulously excavated, documented, and consequently scientifically processed burial contexts is seldom a reflection of archaeological reality. Excavations are, and always have been, expensive and time-consuming. Excavating a large area of a cemetery, done with highly detailed scientific documentation, could amount to centuries of campaigns and research, often not done by the same team. While there are exceptionally well-excavated and documented cemeteries or landscapes that come close to that sample attribute balance, only one of those aspects can be met in most cases. This was also evident in Cătălin Popas's (2018) model study, which incorporated 314 burial contexts stemming from the whole Carpathian Basin. While this number seems ideal, the data quality of most of these contexts presented itself at a fairly low resolution. This was due to the fact that many of Popa's available publications and documentations were made up of various century-old excavation records that were frequently not up to modern standards [14].

Consequently, the apparent key data issue within this thesis would be the small number of graves and burials employed for each particular cemetery's clustering processes, namely 40 graves and 47 burials in Oberndorf, 21 and 28 in Ossarn as well as 12 and 13 in Inzersdorf. Even though the above state ratio is unachievable with the data at hand, ultimately even a very small sample size can be used for clustering in very high dimensional attribute space (Dolnicar, 2002). This actually became beneficial since most grave contexts had undergone rigorous documentation and processing before being made available for this analysis. Incorporating a high-resolution attribute space into a limited sample set. Emphasizing the significance of accurate field documentation and scientific processing prior to any quantitative procedure.

7.2.2 Other Issues and Qualities

Two further data concerns were apparent within the burial and excavation contexts themselves. First, the large number of contemporary lootings evident in all three cemeteries. Second, although future publications will partly resolve this issue (cf. the preliminary report on Inzerdorf: Morschhauser and Pollak-Schmuck, 2021), as of now, all three cemeteries are not excavated to their original extend. In

[14] E.g., Popa (2018, 25) mentions a grave-good bias between weapons and vessel recordings, with an extremely unlikely ratio of 47.3% of all graves that contained weapons, and only 41.4% of all graves containing ceramic vessels. He believes that in many cases, ceramic vessels were simply not documented because they were deemed irrelevant. Additionally, he noted that burial inventories were frequently either not included at all or merely addressed in passing.

Oberndorf, for instance, both issues are evident. While researching two recent rescue excavations (Morschhauser, 2012; Kultus and Kultus, 2021) did close the blatant gap between the original campaigns of 1982 and 2004 to a degree (cf. fig. 6), only one definitive La Tène inhumation could be added [15] and a sizeable gap remained. That issue must be accepted and incorporated into the final interpretation until further publications and excavations are conducted.

On the other hand, the issue of grave openings was more complex. As these graves were looted at a time when these communities and their group identities were still present, these attempts at grave robbery were part of the multi-layered social dynamics discussed in chapter 8.5.2. Unaddressed, the implementation of looted graves did pose significant problems. During the initial trials, graves with intentionally low amounts of grave goods were grouped with wealthy but heavily robbed graves. This occurred due to a similarity calculation based predominantly on the number of burial goods, which consequently falsified the group clusters. This issue was addressed in two ways: first, by placing less emphasis on the quantity of goods and more weight on the material or quality of the objects. The second solution formed the basis of the hierarchical approach to grave-goods recording that prioritised function over form and the high-resolution nature of the data.

A considerable number of disturbed graves were robbed through shafts intentionally dug by grave robbers in proximity to either the chest and shoulders or the hip region. Both locations demonstrate a familiarity with the usual placement of valuable objects during the initial burial ritual. As a result, highly valuable gold or silver fibulae or similar adornments in the chest and shoulder area, as well as weapons worn on the hip and precious metal belts or weapons belts, were absent in several graves. Fortunately, due to the excellent documentation, fragments of these missing objects, such as belt hooks, 'Koppelringe' [16], or sheath remnants, are frequently found in burials. As a result, it was often feasible to depict these looted components of the original object composition, at least in terms of function.

Lastly, specific important information within the data was deliberately left out when computing the similarity clusters. This was mostly relevant within the anthropological data, as similarities in both anthropological sex and age of the deceased would have been potentially overdetermined by the algorithm. Thus implying a priori that people of the same age or sex must have the same identity. By leaving these aspects out of the clustering process but statistically cross-checking and validating it afterwards, it was possible to inspect if, and to what extent, these still-essential aspects of group

[15] A number of cremations could not be dated beyond doubt.

[16] The German term *Koppelringe,* describes iron or bronze rings that are attached to leather belts, specifically weapon belts as they connect the belt with the (cf. i.a.: Pauli, 1975, 114; Rapin, 1991; Łuczkiewicz and Schönfelder, 2021, 123). Due to Vincent Megaw (cf. e.g.: 2012, 453) the German term is used in English literature unaltered and not translated.

identities were relevant for these specific communities and correlated with burial rites and object composition.

7.3 Data Structure and Database

The database created for this master's thesis was specifically programmed to both meet the individual requirements of this method and obtain the maximum amount of information from a low sample size. This could be achieved by using a hierarchical approach to grave goods recordings and highlighting certain grave elements. While previous attempts at cluster analysis based on a hierarchically structured database (Hausmair, 2015; Popa, 2018) used variations of Microsoft Access, this thesis database was built entirely in R with the SQLite database engine embedded.

This was done due to certain restrictive aspects of MS Access and Microsoft in general. SQLite as well as RStudio are, contrary to MS Access, in the public domain, open source, platform independent, and, in the case of SQLite, file-based, which means that all digital information is conveniently saved in one easily shared file. Further, SQLite is supported by most conventional programming languages, which leads to another drawback of Access: the limitations of its implemented user interface. While these restrictions can be overcome by programming your own personalised interface, the only programming language for Access is Visual Basic. As a result, when using R and Access together, two different programming languages are mandatory. This was the primary reasoning for using the R package 'Shiny', a framework to develop web applications in R, from the get-go. The most significant advantage of this package is that most of the necessary methodical quantitative aspects, data input, and cluster analysis are all managed by a single program. In addition, the programme could be expanded to run on a server so that multiple people could work simultaneously and independently of the platform they are using.

In contrast to the programmes used, the basic structure of the database was still based mostly on those applied in previous studies (Hausmair, 2015; Popa, 2018). One exception is the personalised interface. The database, in its multifunctional nature, is comprised of two basic tabs, 'Data' and 'Cluster'. The latter includes all aspects of the clustering procedure, while the former is essentially the database interface. Within the tab 'Data' two further subsections were implemented: 'Grave', which

Level Number	Table Name	
Level 1	Grave	
Level 2	inhumation	cremation
Level 3	inventory	

Fig. 9: Main tables arranged hierarchically (author, based on Popa, 2018, 26, fig. 2.1).

in itself was the place where all the data was recorded or viewed, and 'Auxiliary Data' which will be described in a bit. 'Graves' was the place where every new entry was recorded. It was further divided into the 'Record View' which was the data entry form that also provided the possibility to edit or delete every single data record, 'Table View' a means to easily review or control the already recorded data, the self-explanatory section 'Print' and a filter function for all records. Additionally, this section has a filter function, allowing you to search for and filter records based on specific attributes of the graves, burials, and even objects.

The data was stored within four primary tables, which themselves were arranged hierarchically (Fig. 9). These reflected the data type as much as the order in which they were entered. 'Level 1' contained the basic information that regarded the grave, as in physical and contextual descriptions. 'Level 2' consisted of two different tables that described the buried individuals and were divided by their burial rite. If fresh burial records would be added to the study that include other burial rites, e.g., cenotaphs, another specific table representing these rites would be incorporated within 'Level 2'. This distinction was made for two main reasons. For one, each rite table consists of different information, e.g., the positioning and conditions of the skeleton within inhumations or, oppositely, the position of the cremation remains. Generally, all tables were related to each other in various ways (cf. annex 2 for this thesis Entity Relationship Diagram), which means that every entry in the 'Level 1' Grave table can be related to one or many burials. Thus additionally, a grave could consist of two different burial rites, as with grave 44 (OBD/04), with both an inhumation and a cremation burial.

Lastly, one burial could consist of one or many objects. These objects were themselves entered into one large inventory table. In rare cases, there was the possibility that a grave was void of any objects, as with grave 16 (OBD/82), thus not having any recorded data in 'Level 3'. Also, an object could be related to a grave but not to a specific burial. This was also done only on rare occasions, such as when a grave had many burials and an object could not be indefinitely assigned to one specific individual, or when an object was discovered later in the overburden or grave filling. Whether such objects were implemented in the clustering procedure or not was optional. Within the four tables, every entry was done in succession, as conveyed by the hierarchical structure described above. This was mainly done to avoid mistakes or confusion throughout the data entry. For that same reason, certain functions were integrated within the data recording process. Specifically, so that objects directly related to a certain burial could only be recorded after a burial was added, and with the intention that saving a finished data record, or an edited record was only possible if all present fields within all tables were correctly completed.

Apart from the main tables, a large number of auxiliary tables and auxiliary data were provided. By this means, the content of some variables was standardised to avoid errors during the data entry. For this

reason, the tab ‘Auxiliary Data’ was implanted so that the possible fixed values of every ‘Lookup data’, e.g., ‘Excavation Site’ or ‘Gender’ could be edited, erased, or added. This was especially important within the ‘Object Categorisation’. All values of the four-tiered category system were entered organically, as an object was added to a specific burial and not fixed a priori. This was possible through the ‘Auxiliary Data’ tab, which, like ‘Lookup data’, allowed you to add, edit, or delete values. The only limitation within this was that if a categorization value was already related to an object, it could not be erased.

7.3.1 Table Descriptions

Before continuing with a detailed description of the tables, it must be noted that within these three subchapters, small variations in the text formation were applied for easier understanding. Table section or subsection headings are represented in ‘quotation marks’, table headers in italic and eligible variables will be underlined. The system automatically assigned a unique primary key to each table, which was labelled 'grave ID', 'burial ID', 'cremation ID', 'inhumation ID', or 'object ID'. These numbers served as the primary key for each table in the database structure and linked each entry to each additional level through a system of primary and foreign keys. This system permitted one to easily know from which particular grave and burial each set of information was derived. Lastly, all selectable options or attributes were not fixed a priori but were added organically as they occurred within the burial contexts at hand.

7.3.1.1 Level 1: Graves

The first main table, ‘graves’, contained 15 variables that were thematically separated into ‘general’, ‘physical description’ and ‘contextual description’. In ‘general’ the first entry, ID, was automatically added after finishing and saving a data record. This was the only actual ID field and functioned more as a clarification. All IDs were numbered by the database system by design and functioned as the primary key of each respective table, as described above. As the other IDs in each level were also automatically provided in the background, these IDs were only shown after a completed data record was saved. The second field was Catalogue Nr., a number that correlated with the numbers that were given to a specific grave within the catalogues or publications of a respective campaign. As these catalogues were the very foundation of all essential data recorded in the database, these numbers still represented the main designation for every grave within this master's thesis and even before that in other publications (e.g.: Ramsl, 2002, 61).

One issue that followed from this was that, on some occasions, catalogue numbers were used twice within the same cemetery documentation, but due to programming reasons, the *catalogue Nr.* needed to be unique. This was especially occurring within the Oberndorf documentation, as it had never been published before and consisted of different excavation campaigns spanning several decades. This was

handled very hands-on, as e.g., the designation 'grave 29' was used for two different Oberndorf campaigns in 1982 and 2004, for the second grave 29, the entry 229 was used within the field *catalogue Nr.*, while the first always remained its original catalogue number. If a third grave followed, the entry would be 329. This was not an ideal solution by any means, and in further studies with a larger number of graves, another solution must be found. As a short-term solution, this still seemed more natural. Particularly as for easy recognition in many clusters' visualisations, single graves were labelled only by these numbers and without any additional information as the year of the excavation campaign. After the *catalogue Nr.* the next two entries consisted of fixed values, one being *excavation site,* consisting of Oberndorf, Ossarn and Inzersdorf and the other being *excavation campaign*, comprising of each year of the respective campaigns, e.g., such as 1984 or 2004.

Within 'physical description' most measurable data and additional descriptive data about the grave were stored. For all measurements that described dimensions or volumes, cm or cm^2 were chosen as the standard. First of those was *type*, with flat, tumuli, unknown, and construction as viable options. Next was *form*, which defined the shape of the grave and gave rectangular, circular, oval, irregular, not stated, trapezoidal and square as possible descriptions. Following this was the field *inner construction* that related to any inner construction within the burial context (cf. 8.2), namely the presence of a double pole or quadruple pole system, of a wooden coffin and if there was no inner construction or if this information was unknown for any reason.

The next field *depth* was a field that, for the most part, was left out. This was due to the fact that within Oberndorf, the excavations from 1982 and 2004 were both done by the 'level plane' or '*Planum*' method. Even though the depth in between each planum was stated, the initial depth between the turf and the first planum was not. Therefore, no exact numbers for depth were available and thus were left out. Similarly problematic was *area*. While entries were given if graves had regular circular or rectangular outlines, all shapes that were in some way irregular could not be measured precisely. Hence, these numbers must only be considered estimates and were not used for anything other than contextual information if needed. Contrary to this, the field *dimensions* were more precise, thanks to the detailed documentation. Still most grave outlines must be regarded as plausible approximation attained by excavation techniques, by following outlines. In general, it was always the measurements of the last '*Planum*' that were used for *dimensions*, as technically this should be the bottom surface that was originally used to place the remains of the dead. This was followed by the field *grave orientation*, which contained the following options: N-S, NNE-SSW, NE-SW, ENE-WSW, E-W, ESE-WNW, SE-NW, SSE-NNW, S-N, SSW-NNE, SW-NE, WSW-ENE, W-E, WNW-ESE and NNW-SSE. Last in 'physical description' were *longitude* and *latitude* which contained the coordinates attained via the georeferenced CAD plans. In all cases these plans contained whole outlines of graves. As such detailed

descriptions were not necessarily required for a spatial analysis using QGIS, it was decided to take the coordinates from the centre of each respective grave.

The subsection 'construction' was added later on during the process to address the diverse variation of surrounding structures within all three cemeteries (cf. 8.2). For the first field *outer construction*, the question defined the basic structure of the surroundings at hand. Since some of these surrounding constructions come as layered systems of two or more structures, while others are standalone structures, the choose able options were surrounding standalone, surrounding system, no, unknown, and probable surrounding system. Next came the question of the *surrounding form*, with square, circular, double circular surrounding, unknown, and not applicable as viable options. Following this came a specific question about the number of *surrounding systems*, which clarified if such a system was a singular surrounding, a double system, a triple system, a quadruple system, if this information was unknown or not applicable. Finally, the field *surrounding open* clarified if any such system has evident entry openings, with yes, no, unknown, not applicable, probably open, and probably closed as options.

The first entry in 'contextual description', was *disturbance*, and contained the options; disturbed contemporary, disturbed modern, destroyed, undisturbed and simply disturbed. A similar information followed by *looted* with looted contemporary, looted modern, not looted, unknown, probably looted cotemporary and probably looted modern as possible choices This was completed with a *comment* field for any additional information, if needed.

7.3.1.2 Level 2: Inhumation and Cremation

After concluding Level 1, the operator could add any number of burials by choosing either table 'inhumation' or 'cremation' by using a conveniently designed button '+ new entry'. Only after this, the entry table opened up and allowed further data recording. Regardless of which burial ritual was chosen, the first sub table, 'Burial Information' was always identical as it described all necessary information related to the individual burial remains. The first three entries contained the chronological data related to the buried individual. In most cases, the dating was already provided in the catalogues and excavation reports and was based on burial rites, grave orientation, stratigraphical excavation records, and, most importantly, the burial goods. In all cases where questions remained, these were clarified collaboratively with the authors supervisor.

All these entries were added as simple texts, remained rough within the chronological limitations described in 7.1, and all fields in 'burial information' were only used for the additional statistical analysis. First of those were the fields *dated from [BC]* and *dated to [BC]* which were filled with exact numerical numbers, e.g., 450 and 390, respectively. In *chronology*, traditional archaeological relative chronological terms were added as, e.g., LT A1 – LT B1, or if possible, more specifically e.g., by only

stating LT B1. The next field *offerings* did account for any animal bones added to the burial as offerings. Besides Inzersdorf (cf. Neugebauer, 1996b, 128), such animal bones had not been analysed further, thus it was decided to simply state their presence within a burial, thus the possible options were simply yes, no, or unknown.

The anthropological data came next. These were, as described above, also not used for the clustering procedure but were essential comparative data. The first one was *Age*, and possible options to choose from were neonate, infant, child, possible child, adolescent, young adult, middle adult, old adult, possible adult, and unknown. These possibilities were chosen as they represent the standard anthropological distinction in English literature (Herrmann, Grupe and Hummel, 1990) [17]. Both possible child and possible adult were selected if no proper anthropological analysis was done, but a plausible assumption for either could be made using available illustrations and photography, or if this was already done within the received documentation. In the case that no clear definition was possible, particularly in 'cremations', unknown was chosen. *Sex* functioned in a similar way. Here, the eligible variables were male, probably male, female, probably female, and unidentifiable. Besides unidentifiable, all these options were only chosen if a definitive anthropological sex was attainable. In any other case, including possible previously determined archaeological genders, they were always defined as unidentifiable. This section was again concluded by an *observations* field, in which further details or any other necessary information could be added.

Following this, both tables, 'inhumation' and 'cremation', separated into their own specific subsections that consisted of their own specific data properties. The first of these rites-related fields within 'inhumation information' was a simple yes, no, or unknown choice, which defined if skeletal remains were *intact*. This was followed by a more detailed inquiry regarding the *bone connection*, with anatomic position, partially anatomic position, non-anatomic position, and not stated as selectable options. Following that, the location of the *remains* was requested. Here the possible variants were upper left, center left, lower left, upper right, center right, lower right, center, upper center, lower center, and Unknown. If the remains were at least in partially anatomic position and occupied most of the longitudinal site of a grave, only center left, center right and center were chosen. The specific 'inhumation' subsection was concluded by defining the *orientation* of the remains, incorporating the

[17] The original anthropological analysis for Oberndorf was provided in the German-Austrian System, which contains several differences. While every age definition does have an equivalent, these differences mostly occur within the specific range of a year. E.g., the equivalents of infant and child are Infans I and Infans II. The ranges of infant and child are defined respectively as infant = 1–5 years and child = 6–12 years, while their German–Austrian counterparts are each defined as Infans I = 1-6 years and infant II = 6–12 years. As implied in chapter 6.1.3, such anthropological analyses regarding age, even if done excellently, are rarely precise enough to describe an exact span of years. As a result, these minor variations in the year range were accepted as an approximate age group that provided sufficient detail.

exact same variable as with *grave orientation* with the addition of unknown. The 'cremation information' subsection only consisted of two unique fields. First was the *deposition type,* with ceramic urn, organic urn, and unseparated cremation as options; secondly, the location of the *remains location* consisting of the same variables selectable in its inhumation equivalent.

7.3.1.3 Level 3: Objects

Finally, after entering all relevant data for each burial, 'level 3' was next in line. Within this level, all documented burial goods were recorded, with almost all of them getting their own separate entry. The only exception to this rule was when a convolute of now-separated parts of an original object was documented without specifying how many single objects or fragments were discovered. The inventory table was separated into two subsections: 'Category' and 'Description'. 'Category' consisted of the main variables used for the clustering procedure and was specifically organised in a unique hierarchical object categorization (Nakoinz, 2012; Hausmair, 2015; Popa, 2018).

How this object categorization was constructed will be described in the subsequent chapter. For now, it should be enough to state that these four variables were ordered hierarchically and defined an object's function in its first two categories and an object's approximate typology in its last two categories. These categories were conveniently named *Category 1*, *Category 2*, *Category 3*, and *Category 4*. Specifically for this section, a function was added to add, edit, or delete any value for each category. Due to a rare but relentless bug that led the programme to crash in most situations, this function was not generally used. As a result, the operator is forced to use the same functions provided in the main section 'auxiliary data' beforehand. This was not ideal, as the organic hierarchical data entry system was unavoidably interrupted to first establish, delete, or edit any possible value of the object categorization. For this reason, an extra data sheet containing each inventory item was used in parallel to fix its categories before any object was recorded in the database. Nevertheless, this possibility to change and add values within the entry tables of an object would allow a quick workflow when recording burial goods, at least for future applications.

After the four-tiered category values were recorded for each object, the final sub table 'Description' followed. All other relevant information for each object was entered at this point. The first one was the field *Finding Nr.* which stated an object's specific number within each obtained documentation. This sequence of numbers was only correlated within one specific grave context, as is customary. This was followed by the field *Description,* which contained an individual description for each object, containing only the basic information, mostly also represented within the object categorization. *Dimensions* contained all relevant measurements of an object derived from the available documentation, if any were available. As with previously stated measurements, cm was chosen as the standard unit of length. After this, the number of *Fragments* was questioned, as in how many pieces a

single object was fragmented into when excavated. As this information was often not stated within the obtained documentation, especially in regard to ceramic vessels, it was often chosen to simply state that the number of fragments was Unknown. Only if the number of fragments was definitely stated or was easily determinable from any illustration, a specific quantity was entered. This entry was deemed acceptable because it was at best additional contextual information.

The next field described the *Position* of an object within the grave and in relation to the remains. Fixed values, such as Upper left, Center left, Lower left, Upper right, Center right, Lower right, On/In remains proximity, Upper center, Center center, Lower center, Unknown, Stray find and Inside vessel, could be selected here. Following this, the *Material* of the object in question was stated, including all conventional options, as Iron, Bronze, Glass, Clay, etc., as variables. As with most of the object categorization, these values were not fixed a priori but originally added to the 'auxiliary data' when they emerged during the inventory's reappraisal.

After that, three fields that contained only Yes, No, Unknown as values followed. These fields related to the answer: if an object was *Decorated* or not, if it was *Intact* at the time of their documentation, and if it contained *Scorch Marks*. The next two variables only related to specific object types. First of these was the field *Folded*, with Yes, No, or Not Applicable as possible values. This field declares if an object, such as e.g., swords or knives, was deliberately folded before it was added to the grave as burial goods. The second field described the *Ceramic Production* and stated whether a vessel was Wheel Turned, Hand Formed, Probably Wheel Turned, Probably Hand Formed, if this was Unknown or simply Not Applicable as the object was not a ceramic vessel. The field *HA Derivate* stated if an object type was in any way or form a variant that could be considered an emulated variation of Hallstatt traditions. Viable options were Yes, No, and Unknown. Last but not least, as with all previous tables, this was closed by an *Observations* field, where any additional important contextual information could be added if necessary. This field was frequently used to describe an object's relational position to another object or the deceased's remains in greater detail.

7.4 Object Categorising

As briefly stated above, the applied hierarchically structured object categorization is a data recording strategy, based on the notion that group identities are fabricated, preserved, and expressed through practice. Particularly in this variation, adopted from Cătălin Popa (2018, 32-35). By recording all grave-good items in a four-tiered hierarchical system that focused on their function and shape, the weight shifted from the object itself towards its practical use. These hierarchical categories are designed to progress from very generalist to very specific at level four. Within this hierarchy, the first two categories represented the function of an object, whereas the second two referred to its typology and shape.

The reasoning for prioritising function before shape is based on the research question, which is about group identities. As elaborated extensively before (cf. 8.3), what Bourdieu (1977b) defines as 'habitus', is expressed through our everyday lives and actions. Consequently, social norms are constantly reflected through practice. Since 'habitus' is a conscious as well as subconscious tool to reflect our position and belonging within any group an individual partakes in, group identities should manifest in the material culture as recurring patterns in the archaeological data. For instance, an ensemble of weapons or drinking vessels says more about an individual's identity than the form of any such object. This does not negate the importance of an object's specific shape or typology, as these are expressions of variety and further nuances of identity. While weapons as burial goods do imply the deceased's relation, or implied relation by his or her community (cf. 8.4), to warfare, or at least weapon-related activities, the type of weapon and its typology are further important differentiation factors. Similarly, the material of an object or any other information within the burial context can serve that same purpose. As already discussed, this at least applies within a coherent, known and understood framework (Hakenbeck, 2004, 3; Popa, 2018, 54).

The fundamental structure and naming of the category variables were based on Popas' previous work. As his study was applied to a different chronological and temporal context, many of these variables, especially for categories three and four, changed organically as they occurred and were constantly modified if needed. For the last two categories, which focused on shape and typology, the variables were either defined by an established typology system, as with fibulae (i.a.: Teržan, 1976; Gebhard, 1991), while object categories without such an established system were numbered as they came along, such as knife type 3.

To guarantee a sound categorization for each of the four variables, established typological works and past excavation documentation were employed. In some cases, the allocation of an object to a certain practice was straightforward, as with most weapons or adornments, whereas in other cases, as with vessels, this was surprisingly challenging. For instance, the question if a bowl was used as a drinking bowl or as a eating bowl was dependent on a number of factors, such as the general size, lip diameter, and form (cf. Zeiler, 2010) or its positioning within the grave and temper material (Trebsche, 2011). The publications of the cemeteries of Pottenbrunn (Ramsl, 2002) and Mannersdorf im Leithagebirge (Ramsl, 2011), the works of Brigitte Röder (1995) and Manuel Zeiler (2010) on vessel typology and practical usage, as well as a number of other publications or works of reference used for specific questions at hand, such as the differentiation of spears and javelins (Leshtakov, 2011; Rapin, 2012).

7.5 Data Description and Sources

Since this thesis is not intended to be a documentation of the studied cemeteries or their burial contexts and objects, this section will only be a brief description of the sources the data was attained

from, as well as provision for basic statistical attributes and specific noteworthy burial contexts. A detailed research history for all three sites has already been discussed in its own section; these aspects will be touched upon only briefly if necessary. A comprehensive presentation of all potential burial contexts and grave goods in the Traisen Valley can be found in Ramsl (2020d). For Inzersdorf, extensive documentation has been published by Neugebauer (1996b).

7.5.1 The Oberndorf Data

The Oberndorf data was obtained during four excavation campaigns. Two of those, 1982 and 2004, contained the vast majority of the burials used for Oberndorf. Both were well documented at the time and were later scientifically processed. Hence, two comprehensive unpublished catalogues were made available for me, consisting of detailed, unpublished reports of each burial context along with a chronological and typological description of all burial goods. Both were done by Peter Ramsl, as well as a supplementary anthropological analysis done by Friederike Novotny. Additionally, I received detailed illustrations of each burial context, including the objects and geo-referenced CAD excavation plans. Albeit only one further inhumation (grave 16/OBD/12) could be attained, the provided excavation documentation of both campaigns from 2012 and 2020 were kindly provided by each rescue excavation company, ARDIG and ASINOE respectively (Morschhauser, 2012; Kultus and Kultus, 2021). Both the georeferenced excavation plans and the lists of the burial goods were provided upon request.

As mentioned, the two campaigns from 1982 and 2004 provided the majority of burial data. The excavation record from 1982 consists of 21 graves with 27 individual burials, 23 of which were inhumations, and four cremations. Only grave 102 was incorporated within a circular surrounding structure, with the other five located within the interior of rectangular structures. Five more graves with surrounding structures were discovered in 2004. Only grave 27 is surrounded by a circular ditch as well as being part of a double surrounding system with grave 25. In total, 15 graves were either definitely or probably looted contemporaneously during both excavation campaigns. More specifically, ten graves from 2004 were looted contemporaneously, two of them inside a circular surrounding ditch; the remaining looted burials were flat graves. Additionally, five graves excavated in 1982 were either definitely or at least probably looted contemporaneously. Three of these are flat graves, while the other two have surroundings. Grave 4 was the only grave that was definitely disturbed and partially destroyed by the excavation digger in modern times.

Among the more noteworthy graves from these two campaigns are grave 28 from 1982 and grave 37 from 2004. Grave 28 (fig. 20) is the only quadruple burial. Even more remarkable was their positioning, as two of the burials, a young male adult, and an adolescent, were buried directly above two other individuals, one child and another adolescent. The notable aspect is that the remains of the two lower

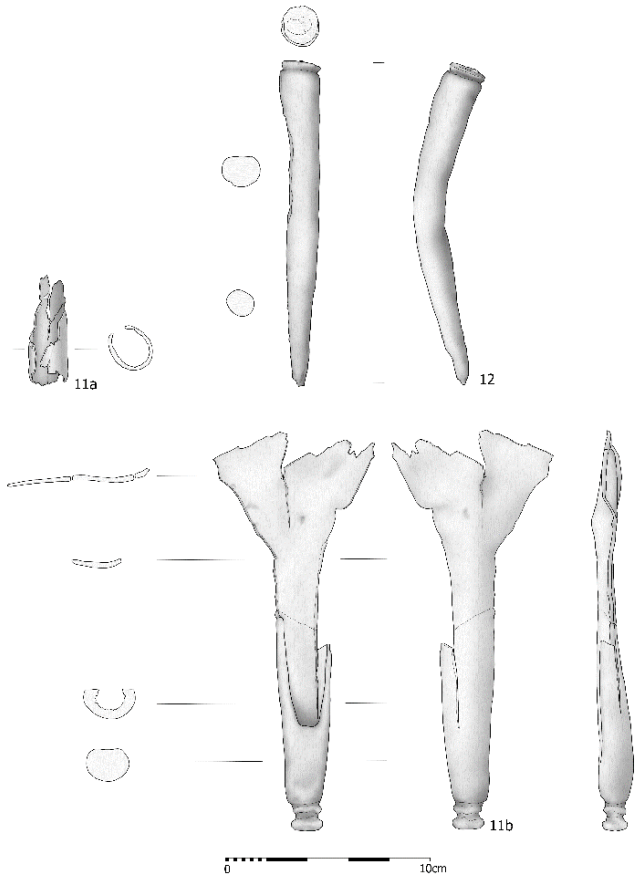


Fig. 10: The three red deer antler artefacts from grave 102 (original graphic by M. Vignoli)

individuals were still in partially anatomic positions, with the exception of both skulls, which were intentionally placed at the base of the respective burials above.

Grave 37 is one of two potential female weapon burials in Oberndorf, the other being grave 102 (OBD/82). Similarly, to grave 102, 37 was both integrated within a circular surrounding and extremely disturbed and looted. Most of the skeletal remains were either missing or disrupted. Only the right leg, both feeds, and, most importantly for the anthropological analysis, the pelvis remained in situ. The hip area was looted extensively, with only fragments of a box belt plague remaining. However, the grave robbers seemingly missed two javelin heads in the upper left of the grave. One of them was the only clearly decorated variant among all javelin or spear heads included in the Oberndorf data. Another 'anomaly' within this burial are three unique, unidentifiable, and fragmented red deer antler artefacts (fig. 10).

This set of objects lay beneath the feet of the female individual and consisted of one small, hollowed object (11a), another Object that is slightly bend and flattened on one site with a circumferential groove (12), and the largest object (11b), which is also hollowed, broadened, and fragmented on one trapezoidal end, and on the other, with a similar, albeit less flat, circumferential groove. While no definitive parallel for antler objects could be found (cf. i.a.: Holzer, 2009; Hrnčiarik, 2019), there are noteworthy tools at the Dürnnberg '*Nordgruppe'* in regard the object's potential usage: one iron tool in grave 321, whose shape is not unsimilar to that of grave 11b, and a hollowed antler point in grave 322. Both objects have been suggested for medical use (Zeller, 2003, 536-539). Although these objects could be considered an important depiction of the deceased individual's identity, they were ultimately classified as unidentifiable due to a lack of a clear typology or function and thus were not included in the clustering process. Finally, as with grave 102, textile remains survived on the iron belt fragments. All of these, along with similar preserved textile residues from grave 18 and 25 from 1984, and graves 21 from 2004, were analysed and published recently by Peter Ramsl and Karina Grömer (2019).

7.5.2 The Ossarn Data

The Ossarn data, namely the preceding burial context and object revisions, subsequently created cumulative georeferenced excavation plans, and burial illustrations were again provided by my supervisor, Peter Ramsl. As described in 5.1.1.2, the Ossarn data stems from six excavation campaigns: three that occurred from 1963 to 1969 and another three from 1982 to 1984.

Although the documentation from the 1960s is excellent considering its age, it contains the most data gaps. At least relatively speaking, because a high resolution attribute space was still available, thanks to two publications by Kristin Engelhardt (1969; 1976) and numerous revisions, including the aforementioned revision by Peter Ramsl (unpublished) and the catalogue from the Viennese Study Collection of the Department of Prehistoric and Historical Archaeology (2009). Despite this, many objects' attributes could not be determined as precisely as for the remaining campaigns and ended up in either category 'others' or 'unidentifiable'. The documentation for grave 3 (OSS/66) was insufficient to the point that it needed to be omitted.

For the 1980s campaigns, the data quality was exceedingly better, as these campaigns were part of the rescue excavations stemming from the construction of the motorway S33 (cf. 5.1.1; Neugebauer and Gattringer, 1983; 1984; 1985-1986). Along with the initial excavation documentation and later revisions, Silvia Renhart (1996) published an extensive anthropological study for the Ossarn burials of these campaigns, along with similar studies for Inzersdorf, Herzogenburg-Süd and Franzhausen. Since these campaigns were rescue excavations, certain issues still occurred. Graves 1 and 21 from 1984 were destroyed in modern times and had to be removed as a result. Grave 28 from 1984, although well documented, could not be located indefinitely in any excavation plan. As it could be at least allocated to parcel 169/1 (Neugebauer and Gattringer, 1984 and 120, Abb. 18/2), within the Early Bronze Age section of the cemetery, it was not excluded. The opposite issue arose with grave 24 from 1985, since it was evident on all excavation plans, but no documentation could be found, rendering this grave unfeasible.

The cumulatively utilised Ossarn data contains 22 graves and 28 burials, among which are 25 inhumations and only 3 cremations. The latter are all part of the quadruple burial in grave 6 from 1984. Grave 25 from 1963, is the only burial that has a surrounding structure, more so because it has the only solitary circular double ditch surrounding system of any excavation data used. Only two graves, 2/66 and 13/84, were definitely or probably looted contemporaneously, whereas grave 8/69 was mostly looted in 1969 (cf. Engelhardt, 1976, 362). Further graves from Ossarn that should be highlighted are grave 17 from 1984 for its famous 'sphinx' like figural fibula and the largely destroyed grave 23 from the same year, which contained the remains of one of two wooden coffins within all applied data.

7.5.3 The Inzersdorf Data

The late edition of the Inzersdorf excavation data of 1987 was the most straight-forward, as it was comprehensively published beforehand (Neugebauer, 1996b). Besides detailed excavation and burial context analysis, the publication contains a georeferenced map, an extensive number of drawings, pictures, and object lists, the aforementioned anthropological report from Silvia Renhart (1996) as well as a list of all animal bones by Erich Pucher (Neugebauer, 1996b, 128-129). The latter was not utilised due to the lack of similar detailed lists for Oberndorf and Ossarn.

The excavation data comprises 12 graves and 13 burials. 11 of these are inhumations, and only grave 282 contained two cremations. All graves had a surrounding construction. Among these, only graves 272, 320, and 282, albeit in direct proximity to the quadruple system, were standalone surroundings. Graves 268 and 270, as well as 277 and 279, were part of a rectangular double system. Most prominent is the circular quadruple system that contains the graves 284, 285; the overlapping graves 288; and the child burial 287, as well as grave 289, which has a separate entrance to the south. Also characteristic of Inzersdorf are double (graves 270 and 279) and quadruple (graves 288, 289, and 320) post pits, either at the sides or at all four corners of each grave, that have already been discussed in 9.4.2.1. Lastly, grave 284 is the second grave, besides the above-mentioned grave 23 (OSS/84), that had wooden remains that indicate a wooden coffin.

8 Methodology 2: A Quantitative Method with Qualitative Data

This second part of the methodology primarily serves to portray the quantitative practical tools applied in this thesis. These tools are part of a larger working apparatus, consisting of context, theory, data, and method, that has already been extensively portrayed over the course of this text. Since some of these are stepping stones for the application of the quantitative tools described in brief, I'd like to highlight the first methodology chapter 4, particularly 4.1, which explains the fundamental establishment of the working apparatus, along with theoretical considerations on problems and advantages of statistical application in archaeology in chapter 4.2, a description of the 'Object Categorization' (9.4), and a discussion on the theoretical foundation of this data collection method, the theory of 'habitus' (8.3).

By and large, the quantitative tools are based on Catalin Popa's (2018) model study. Only in specific instances have these been adapted to particular contextual and practical requirements. One practical adjustment was to bundle the algorithm, clustering procedure, and some additional statistical analysis in R. All of these tools were created using various R libraries and statistical packages, as well as the database itself, which was integrated into a similarly specifically designed user-friendly interface created with the R package Shiny. Since this thesis set out as an interdisciplinary effort, the programming and complex mathematical operations have been done in close collaboration with my colleague Simon Braito. His contribution, which includes a brief, concrete formulation of both applications of the similarity algorithm, is added as an appendix.

The following pages serve primarily as an additional, autonomous, in-depth outline of the practical applications. Particularly how the clustering procedure organised the funeral data based on the algorithm's calculations and how these clusters were analysed and interpreted using the built-in statistical tools along with Microsoft Excel PivotTables, as well as a rudimentary spatial analysis performed with QGIS. As a secondary benefit, this chapter is also intended as a means to reproduce this methodology. For even further details on the mathematical and programming aspects, cf. the appendix, Popa's' own methodology (Popa, 2018, 56-83), as well as extended introductory work on clustering procedures in archaeology (Shennan, 1997, 216-264; Drennan, 2010, 309-320; Carlson, 2017, 319-346) and in general (Agresti, 2007; Everitt, Landau, Moven, et al., 2011; Hothorn and Everitt, 2014, 377-397).

8.1 Cluster Analysis

In simple terms, clustering algorithms are a tool to group sets of data and to substantially assist researchers in classifying and consequently interpreting such data sets. Particularly when confronted with large sets of variational and complex data that feature themselves equally significant sets of

interconnected attributes. The main advantage and disadvantage of this method is that any interpretation of received clusters must be purely empirical, as it lacks an inherent established theoretical foundation. Such groupings are therefore generally independent of pre-existing categorization systems, but still need to be validated by alternative clustering methods and critically assessed in accordance with context related scientific standards (Everitt, Landau, Moven, et al., 2011; Hennig and Liao, 2013, 315–318; Popa, 2018, 67).

Due to several constraints, such as scale and time, the ideal validation practices would be implementing three different clustering methods, such as 'Hierarchical Cluster Analysis' or 'Agglomerative Nesting' (Agnes), along with 'Partitioning Around Medoids' (PAM) and 'Fuzzy Clustering', as done by Popa (2018, 68), was not possible. The most common method, hierarchical clustering, was used in this case, based on the R function 'hclust' from the 'stats' package (RDocumentation, 2022). However, a number of deferring hierarchical clustering methods based on the same similarity principle were used for validation, namely 'Single -, 'Complete -, 'and 'Average Linkage' as well as 'Mcquitty', 'Median' and 'Centroid' (cf. Everitt, Landau, Moven, et al., 2011, 73-78).

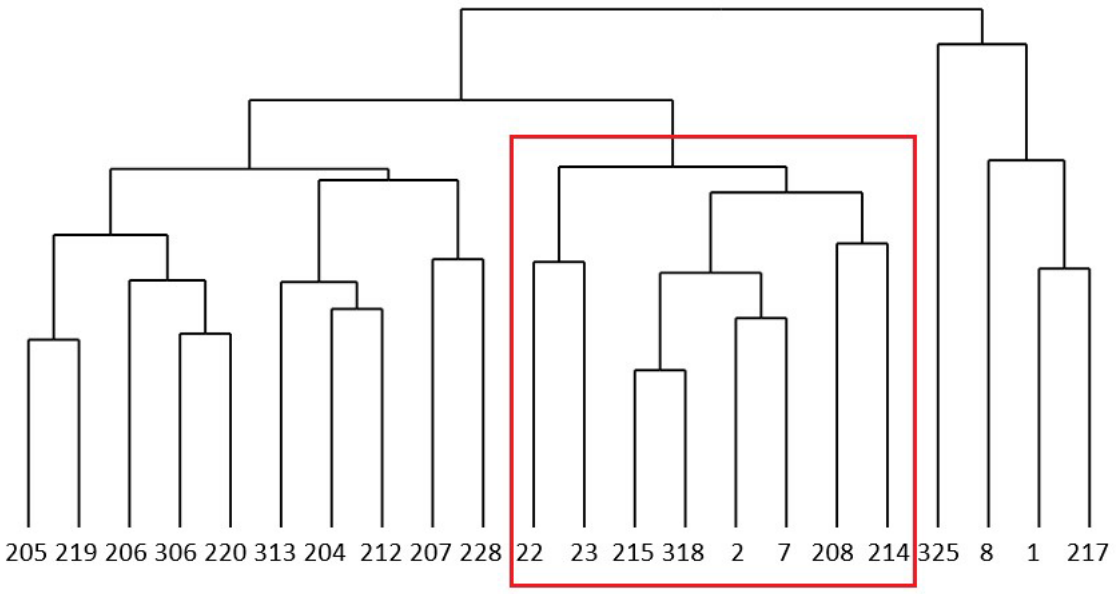


Fig. 11: The final Ossarn dendrogram. Exemplary, within the red area is Ossarn's cluster group 6,including subsequently omitted graves (Author).

In any scenario, 'Hierarchical Clustering' algorithms do not directly determine the group membership of each case in a dataset but instead produce a hierarchical tree (fig. 11). Such dendrograms are analysed by placing a line on the hierarchical tree, so that all instances belonging to the same branch are grouped together. This can be done either purely empirical, by observation, or with the assistance of packages provided in R, such as the Dynamic Tree Cut package (Drennan, 2010, 318; Popa, 2018, 69). Multidimensional Scaling (MDs) is another crucial tool for analysing obtained clusters and for

visualisation purposes, as it allows to display clusters and their interconnections (Popa, 2018, 70). This method of data visualisation aims to generate an n-dimensional graphical representation of the data based on how similar or dissimilar they are to one another. Finally, the ’metaMDS’ function from R's vegan statistics package (Oksanen, Simpson, Blanchet, et al., 2022) was used to perform "Nonmetric Multidimensional Scaling" with "Stable Solution from Random Starts" on the nonmetric data used in this and Popas' (2018, 70) studies.

8.2 The Similarity Algorithm

The quantitative method applied consisted of a number of statistical background procedures that are summarised by the calculations provided by the similarity algorithm and a number of consequent clustering methods. The similarity algorithm utilised is almost identical to the one originally conceived and programmed by Catalin Popa (2018, 59-66). Before being presented jointly to the operator, the variables on which the algorithm's computations run are measured twice separately in the background. This separation also represents the two base categories for the variables used. Those that are ritual based, such as ‘grave type’, ‘ritual type’ and ‘multiple burial’ and those that are object based, such as the four tiered object categories (cf. 9.4), ‘material’ and ‘decorated’. The latter was the only addition, as, contrary to Popa's set of data, the high-resolution data at hand allowed this variable to be added. Besides this, all variables were selected based on the same theoretical grounds presented by Popa, which were further expanded holistically during the course of this thesis (cf., i.a. chapters 5.2.3 and 8.3). In order to conclude this holistic working method, the next and last theoretical subchapter will introduce the psychological concept of ‘in- and out-Group bias’, which acts as the theoretical foundation for the similarity algorithm.

8.2.1 Theoretical Basis: Social Identity Theory and In-Group Bias

In its most basic form, this concept depicts how people who identify with one group will display affinity and prejudice toward their own group over any out-group or individual outside their own group. Both disparities, and common features, in either outside groups or within a social group itself, arise and are reinforced as a subsidiary effect of ‘habitus’ formation, towards outside groups and within a social group itself. This concept, coined ‘in- and out-group bias’ was originally formulated by the social psychologists Henri Tajfel and John Turner (i.a. Tajfel and Turner, 1979; Tajfel, 1982) as part of their ‘social identity theory’ in the 1970s and 1980s. ‘Social identity theory’ was designed as a means to predict and analyse intergroup behaviour (Stets and Burke, 2000). Both, individual and group identities are defined and nurtured through their own groups’ perceived prestige, legitimacy, stability, and differences from other competing or non-competing groups. In addition to this, Turner (1987) formalised the ‘self-categorization theory’, defining how a person recognises a collection of people as a group and the consequences of perceiving humans primarily as members of groups. While ‘self-

categorization theory' focuses more on the cognitive nature of the interplay between individual and social identities, 'social identity theory' focuses on facets of social structure and predictions of how this interplay will influence and form the expression of that behaviour (Turner and Reynolds, 2003). Henri Tajfel also substantiated the impact of 'in-group' and 'out-group' categorization by applying 'minimal group paradigm'. This methodology explored the minimal conditions that are required to establish discrimination between groups and showed that individuals can form in-groups bias in extremely short timeframes. Even if the bases of such bias, and consequently discrimination, are artificial or arbitrary (Tajfel, 1970; Tajfel, Billig, Bundy, et al., 1971).

Importantly, though, 'in- and out-group bias', as any theory presented in this thesis, must not only be reduced to its extreme ends, but rather seen as a spectrum of possibilities. While it is undeniable that variants at the extreme ends of that range will almost always result in the suppression or discrimination of 'out-groups', the majority of variants in between are more subtle. Groups can highlight their own uniqueness and differences from each other and still exist peacefully and willingly next to each other. Cooperation and conflict are not mutually exclusive but exist concurrently and interchangeably depending on the context. Furthermore, identity is neither a static nor one-dimensional concept. The vast majority of people belong to diverse groups with their own collective identities, sometimes even unintentionally. This can lead to an inconsistent stratigraphy of group identities in which an individual feels a varying sense of belonging. It is therefore essential that applying 'in- and out-group bias' as a basis for studying group identities does not necessarily attempt to prove or imply dividing intergroup dynamics. It is more of a theoretical tool that establishes the principle that many members of groups will highlight their affiliation to that same group in some way, thus either intentionally or unconsciously emphasising their non-affiliation with any other group. While in many instances 'in- and out-group bias' is conveyed immaterially, other means of expression are physical representations of group identities enacted by practice. Consequently, these similarities as well as dissimilarities should be visible within the archaeological record and the clusters calculated by the similarity algorithm (Canuto and Yaeger, 2000, 2; Allison, 2008, 41-42; Popa, 2018, 56).

8.2.2 Construction, Calculation, and the Weighing Process

Similarity algorithms are a common practice and are often provided as open source. Nonetheless, these pre-existing statistical procedures are generally designed to function with numeric values, either continuous or binary data, and are not compatible with the data used in this or previous studies (Drennan, 2010, 271-283; Everitt, Landau, Moven, et al., 2011, 43-69; Popa, 2018, 60). For this reason, it became a necessity for Popa (2018, 60-66) to create his own similarity algorithm, which in itself is the basis for the algorithm applied here. Popa's algorithm was specifically devised to process funerary data. Hence, to be complementary with the 'Object Categorization', to allow measuring the degree of

similarity or dissimilarity between grave contexts and to be able to quantify the empirical conclusions obtained by that comparison (Popa, 2018, 60). There are a number of suggested and long established methods to achieve this transformation (cf. i.a. Agresti, 2007). Popa (2018, 60-61) converted every string-type data (e.g., 'inhumation', 'bronze' etc.) to integer types (1, 2, 3, etc.) in a controlled way. This marks the most significant difference between Popa's algorithm and the one in this application. For practical reasons, all string-type data are directly compared and given a value of 0 if they are dissimilar and 1 if they match. The resulting score falls within the interval [0, 1].

8.2.2.1 Calculating Ritual Based Similarities

In essence, the algorithm calculates a value to define the degree to which each grave is similar or dissimilar to every other potential grave, based on the weight assigned across each variable. As stated, the algorithm determines the similarities of the graves based on ritual information and the same similarity based on the grave-goods independently. Compared to the grave-good similarities, the ritual-based similarity calculation is rather intuitive. Using the three ritual-related variables of 'grave type', 'ritual type', and 'multiple burial', each grave was compared to every other grave individually. The requirement for two variables to be comparable is that they both have the same value, i.e., 'yes' or 'no'. If both variables met this requirement, then only the variables were considered to be comparable. It should be noted that, in contrary to this application, in Popa's (2018, 61) study, variable value weights were exclusively employed for object-based similarity calculations. Nevertheless, he did state that the method used also allowed for the inclusion of variable value weights for ritual-based similarity (Popa, 2018, 61, fn. 4). Thus, the algorithm determined a number between 0 and the total of all the variable weights by applying this condition to each variable. As there are three variables, e.g., the similarity index across two graves would be between 0 and 3 if each variable were assigned a weight of 1. The standardisation of this similarity index is done by dividing it by the highest possible value. This process converts each index to a number between 0 and 1, with 0 indicating that the two graves being compared are entirely dissimilar and 1 indicating that they are identical.

The reasoning behind each attributed weight to any variable is always strictly based on empirical evidence derived from an established context. For instance, since it has been established that bronze objects as burial goods are a potential indicator of this community's partial group identities, the weight of this variable could potentially be slightly increased. In other cases, as with 'multiple burials', certain aspects of data quality can lead to an overdetermination of that similarity by the algorithm, warranting a decrease in this specific value weight. These increases or decreases are not massive interferences, but rather slight adjustments to either reflect contextual information the algorithm cannot apprehend on its own, or address data issues. According to Popa's Popa (2018, 61) previous observations, as well as conducted trials for this thesis, the most plausible results were achieved by executing the algorithm a large number of times with different weight sets, comparing the results, and selecting the one with

the clearest patterns and most conceivable weight values. A process fittingly analogized by Popa (2018, 74) as finding a specific signal frequency with a radio, whereas the weighing process is the equivalent of tuning knobs. The ideal frequency range should be translated into distinct, plausible group clusters. These should be evaluable using a combination of statistical similarity or dissimilarity indices, a well-established empirical contextual cultural framework, and they should be reproducible using various clustering techniques.

8.2.2.2 Calculating Object Based Similarities

Albeit similar in principle, it is considerably more complex to calculate the similarity between graves based on the funerary inventory. This is due to the fact that the process of comparing two graves consisted of two stages. In the first stage, each grave good from the first grave is compared with all of the other grave goods from the second grave based on the inventory related variables: ‘category 1’, ‘category 2’, ‘category 3’, ‘category 4’, as well as the object's ‘material’ and whether or not it is ‘decorated’. All of these comparisons yield a matrix of ‘m’ by ‘n’ components, where ‘m’ represents the total number of burial goods from the first grave and ‘n’ from the second. As with the outcome of the ritual based similarities, the values in the matrix vary from ‘0’ to the total of all the variable weights plus the weights of the variable values.

In the case of burial goods, each individual object category value, including category 4, can be weighted individually, making the burial goods' weighing process significantly more complex. For example, the weight of all ‘category 2’ objects in general can be changed, as well as the value of all drinking vessels in that same category, or one particular type of bowl in ‘category 4’. As a result, the algorithm includes an additional figure in the similarity index computation. This additional number might optionally be negative, but its absolute value cannot exceed the variable's assigned weight. Because of this, it is necessary for each similarity discovered between two graves to provide a minimum positive value to the similarity index. In contrast, weighing a value negatively permits the discretionary exclusion of entire object categories. This was done, e.g., for the majority of objects in the category 'others' and for all objects classified as 'unidentified,' as these values have distorted similarities based on a comparable number of small, not definitively identifiable, or assignable mechanical components, such as small rings, fittings, or rivets.

In Popa's (2018, 60) application, the sum of variable weight and variable value weight is constrained to be strictly positive as opposed to non-negative, i.e., including ‘0’, which is the case here. As shown in the example above, this makes it possible to cancel out a variable's weight contribution. This adjustment achieves the same result as explicitly declaring that matches should be ignored for specific variable values, such as 'unknown'. The GUI (Graphical User Interface) limits ranges for variable weights to the range '0,1' for usability reasons. The minimum value for variable value weights is the

negative of the corresponding variable weight, and the maximum value was '10'. This allows for sufficient freedom to configure reasonably achievable weight distributions. This weighting process additionally permits empirical data to be used as an indicator and justification to raise or decrease the relevance of individual burial-goods in grave comparisons. As with the plausible significance of drinking-related vessel convolutes found in a substantial proportion of Early Iron Age burials within the Traisen Valley (Ramsl, 2018c, 119-125; 2020d, 415-416; Trebsche, Bagley, Karwowski, et al., 2020, 471). Furthermore, based on established empirical context, it is possible to evaluate specific, limited predictions on the anticipated significance of specific burial objects in terms of group identity. Finally, in situations where a pattern is detected based on grave-good pairings, but statistical noise prevents its exact identification, the weighing process allowed the results to be fine-tuned to make them clearer or even falsify them.

After summing the variable and variable value weights, the second phase of the object based similarity computation consists of identifying the greatest value of the similarity index based on grave-goods comparisons. This is accomplished by selecting several values from the matrix created in the previous phase and adding them together. This was done, following two essential principles. First, there was only one choice for each row and column in the matrix. Second, the minimum between ‘m’ and ‘n’ has to be equal to the number of matrix values chosen, where ‘m’ and ‘n’ refer to the number of columns and rows of the matrix, respectively. The conditions essentially stipulated that each grave-good could only be counted once in total. If one grave had a drinking vessel and a bracelet and another featured four bracelets and a drinking vessel, the sum that determined the similarity between the graves would include a comparison between the bracelets from the first grave and one of the bracelets from the second grave (Popa, 2018, 62-63).

Based on those criteria stated above, selecting the numbers from the matrix that yielded the maximum total is an exceptionally complex task. Calling for a significant amount of necessary computing power to remain practical. To accelerate computing, Popa (Popa, 2018, 63) was required to employ a non-exact heuristic method for determining maximum matches. Because computing speed was not an issue in this case, it was determined that this was unnecessary and was resolved by an established combinatorial optimization algorithm (Kuhn, 1955). As with the ritual similarity calculation, the next step is to standardise the result by dividing the calculated total by the greater of two cumulated weight indexes. These indices are calculated by adding, for each grave, the weights of the variables describing all of its grave goods and any potential weights associated with the values of these variables. Again, the acquired result was between ‘0’ and ‘1’, with ‘0’ indicating that the two graves are completely unique and ‘1’ suggesting that they are similar.

8.2.2.3 Combing Both Similarity Matrices

Finally, we receive two similarity matrices, for ritual based and object-based similarity, respectively. Technically, it is possible and legitimate to run the clustering separately and to transform similarity matrices into two individual distance or dissimilarity matrices (Shennan, 1997, 222-227; Popa, 2018, 64). Clustering was done concurrently for this application. This was done based on a presented algorithm function (fig. 12; also: Popa, 2018, 65-66), which already accounted for inconsistencies derived from a purely arithmetical function, which considered standardised ritual and grave-good similarities between 'grave i' and 'grave j' strictly equal. In such cases, a similarity index of '0,5' would have been produced between two graves similar in 'ritual' and 'number of objects', regardless of whether there were two different objects each, or 10 different objects each. Disregarding that, in the first instance, these two graves would have been significantly more similar than in the second case. To counter this issue, Popa introduced another weighted variable 'α' to the function (fig. 12), which serves as a parameter that varies according to the maximum number of grave-goods.

$$S_{i,j} = \frac{R_{i,j} + G_{i,j}}{2} \qquad S_{i,j} = \frac{R_{i,j} + \alpha \times G_{i,j}}{\alpha + 1}$$

where

$S_{i,j}$ is the final total calculated standardized similarity between grave i and grave j
$R_{i,j}$ is the final calculated standardized similarity between grave i and grave j based on the ritual variables
$G_{i,j}$ is the final calculated standardized similarity between grave i and grave j based on the grave-goods
α is a parameter that varies according to the maximum number of grave-goods

Fig. 12: Popas functions (edited by author) for combining the matrices. Left: the arithmetical function; Right: the adjusted function with 'α' added (Popa, 218 65-66).

The 'α' parameter operates as a regulator for the final similarity index. Its adjustment determines how much each conceived final standardised similarity, ritual and object-based, contributes to the ultimate similarity index. In this case, the values chosen differed slightly from test run to test run and were obtained by the same empirical validation process as the remaining weighing aspects. Importantly, if two compared graves have a low number of artefacts, 'α' assumes in general values less than 1 and places a greater emphasis on ritual similarity. In contrast, if two graves contain a large number of objects the 'α' value had to be greater than 1 and places a greater emphasis on ritual similarity. Only in rare cases, when 'α' = 1, both similarities weigh exactly 50/50 within the equation.

8.2.2.4 Transforming Similarity into Dissimilarity

The final step of the clustering process was to convert the final similarity into a dissimilarity index, or distance matrix. This is particularly necessary for the visual representation of the similarity clusters. On its own, a distance matrix remains a non-Euclidean value, one that cannot be translated geometrically. However, since dissimilarity generates distances, in contrast to similarity indices that only produce proximity, these distances can be spatially arranged as precisely as possible by tools such as MDs (multidimensional scaling). There are two common equations to transform similarity into a dissimilarity

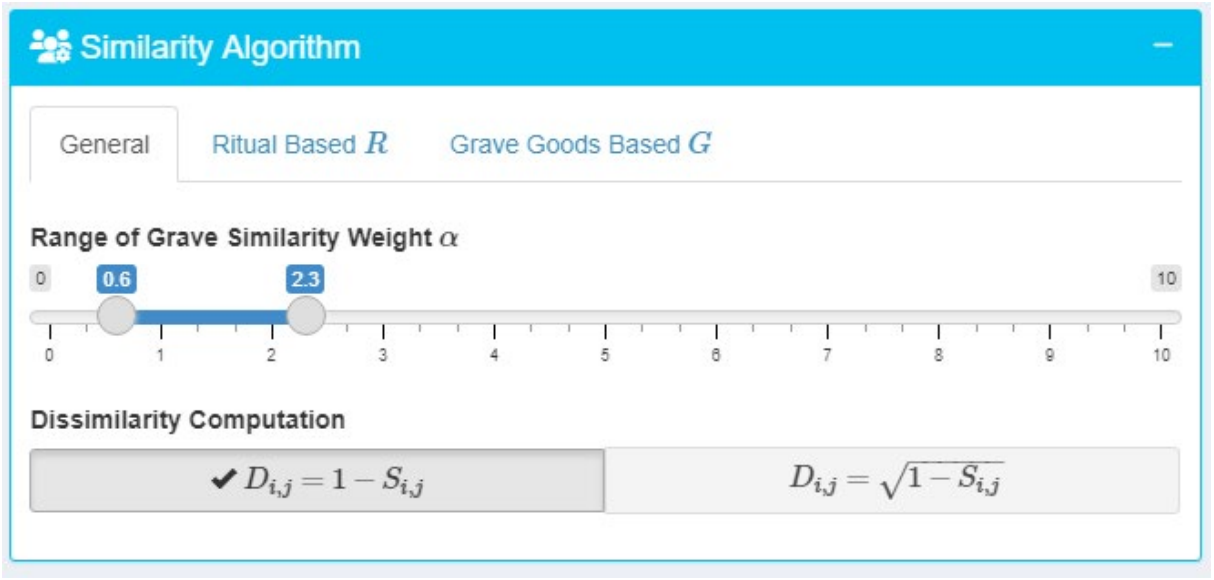


Fig. 13: GUI of the database algorithm application with both dissimilarity index equations (GUI designed by S. Braito)

index (fig. 13). The primary difference is that the second equation renders graves more similar to one another, or rather, less dissimilar, than the first one does (cf., for more detail: Appendix; and Popa, 2018, 64-66). Within the GUI (fig. 13) each could be chosen before every individual clustering process, allowing to perform both variations, for further validation. Even if the similarity index was based on tried and tested clear clustering patterns and plausible weight values, the differences were extremely minor.

8.3 Statistical Analysis via R and Excel

The final clusters on their own possess only fragmentary information for any further interpretation. Only by applying further statistical analysis can any such clusters be understood and consequently interpreted correctly. It is at this stage that independent values, such as age, sex, and chronology, that were purposefully excluded from the clustering process are reintroduced. These values, along with all other data used in the clustering process, are then cross-referenced, counted, and compared to each other as well as to any obtained cluster.

This step also allowed further validation and testing to determine if any predominance of particular values, be it based on the weighing of the researcher or simply on inescapable data issues, interfered

with or altered the obtained clusters in a dramatic way or not at all. For instance, graves with ‘multiple burial’ were initially always clustered together based on this similarity. After decreasing the weight of this variable gradually multiple times, most of these graves plausibly got clustered into other groups based on other more substantial similarities. All except two (18 and 28/OBD/82), which remained grouped together even after "multiple burial" as a clustering factor was completely eliminated. Only after statistically analysing these graves further did it become apparent that besides the large number of decorated objects, there was also a dominance of certain object types and categories, evident in a composition that was similar within those two graves that always clustered them together. By incorporating sex and age into the relationship, these two graves revealed even more similarities that were not captured during the clustering process (cf. 12.1.5).

These statistical analyses were initially planned to be completely integrated within the R interface. Due to time constraints, this was not entirely possible, and only object-related aspects, such as the number of objects and the number of decorated objects, could be integrated within the clustering GUI in R. Albeit a sacrifice, at the very least, these specific analysis tools added further analytical attributes such as mean, standard deviation, min, and max, along with percentage and actual count in relation to all obtained clusters and other grouping variables such as the excavation site or any number of specifically selected graves.

For all further analysis, two auxiliary tables were imported into or produced in MS Excel and examined with the help of ‘Pivot Tables’ and various diagrams. The primary auxiliary table was comprised of all the necessary data used for the clustering, besides the ‘object categories’. This table also reintroduced all individual variables such as the above mentioned sex, age and chronology, in addition to a number of further variables, i.a., such as if a grave was contemporaneously looted or not, what type of surrounding structure was built around a grave if present, or the presence or absence of certain context related peculiarities such as the unique burial custom of deliberately placed larger graphite tempered vessel fragments (Neugebauer, 1992, 141–142; Ramsl, 2020c, 340). Moreover, multiple burials within graves were analysed individually as well as in context with their joint grave. To add the intricate object categorization, a CSV file was exported from the database into MS Excel. For this exported table and the main auxiliary table, a one-to-many relationship was created, with the burial ID being the primary key as it was the only related unique value in the primary main auxiliary table.

8.4 Spatial Analysis via GIS

Lastly, to reintroduce the spatial context and to visualise and observe the geographical distribution of graves and group clusters, georeferenced maps were generated via QGIS. This was possible since all burial data was provided with geodetic point coordinates obtained during the initial excavation campaigns. The ALS maps were provided free of charge by basemap.at (2019).

This type of analysis was invaluable for examining the spatial distribution and intercorrelation within each single cemetery. Particularly for the largest data set from Oberndorf (fig 14). Although not completely excavated, it was possible to depict the spatial composition of the group clusters in relation to each other and even in relation with Early Bronze Age, HA C and Roman period archaeological structures. Adding additional aspects of group identity interdependence.

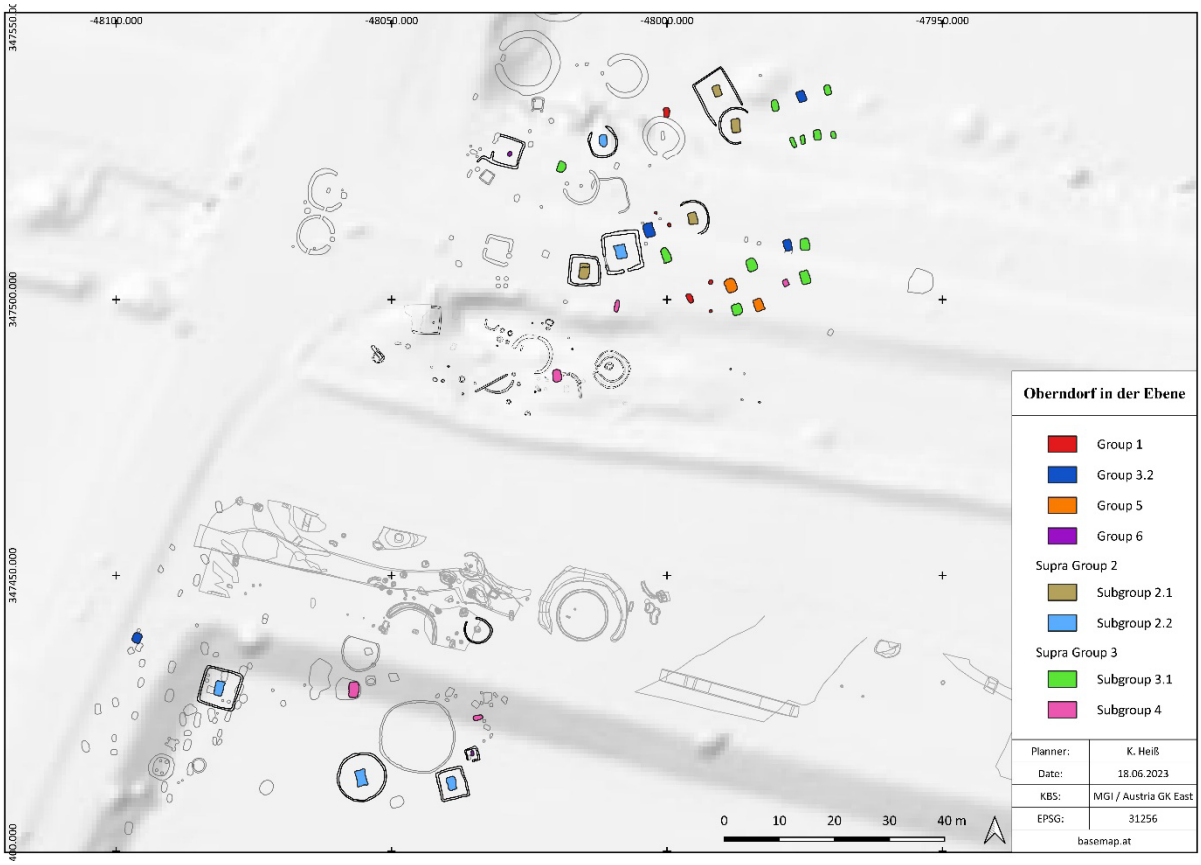


Fig. 14: Map of Oberndorf portraying the cumulative clustering. The grey contexts are bronze age and roman structures derived from multiple derived excavation documentations (map by K. Heiß*).*

As for the geographically fragmented analysis in the valley, a map containing all three cemeteries was deemed inconclusive. Consequently, a cumulative map was generated only incorporating Oberndorf and Ossarn because of their very close proximity. Albeit still not satisfying in its informative value, this map was still informative if compared with single cemetery maps and the larger established Traisen Valley context. Additionally, it shows the potential of such spatial analysis if clustering could be done on a regional level, incorporating most if not all burial contexts, as seen in Popa's (2018).

9 Results

This chapter is a uninterpreted presentation and description of the results obtained and in how these were acquired. To achieve a better understanding of the results the text formation for this chapter is slightly changed. This is done in a similar matter as in subsection 9.3.1 since the databases section and subsection headers and their variables are part of the cluster computation. For this reason, all values

that are table sections, or subsections headlines again in ‘quotation marks’ and table headers are in *italic*. Any variable will be underlined, even if those were only used for the statistical analysis. Variables such as the number of objects and the presence of multiple burials that are elements of the clustering calculations but are not strictly speaking part of the database, as they were derived naturally during the data entry, will also be in *italic*. Numeric weighing variables or any other numeric value that are part of, or results from the clustering process are always presented as digits. The standard text formation set up described in 5.1 is still implemented. This chapter will be followed by the final chapters Interpretation and Discussion.

9.1 The Pathway to the Final Results

The general mode of operations following the data input was a constant, documented series of test clusterings. During these trials, the weighing of the various values as well as the usability of the method and all available tools were tested. These trials were done in blocks based on the day and excavation site. Every trial block began with an initial clustering process, and by documenting all specifications and weights of that initial clustering as well as all modifications of each significant subsequent trial of that block within an auxiliary MS Word document. This was repeated until well defined, plausible clusters were obtained. These were consequently validated by similarity indices: the silhouette score (Rousseeuw, 1987) and the Dunn index (Dunn, 1974a; Dunn, 1974b), the reproducibility of any obtained cluster by using different hierarchical clustering techniques, and finally by empirically contrasting these clusters with the established archaeological context.

Many processes and tools described above, while based on Cătălin Popa's previous work, have not been strictly predefined [18]. They have rather been altered, changed, or fine-tuned situationally throughout the various stages of the methodical application. All such changes and alterations have been mentioned above, and only occurred if the specific set of data at hand, or the software either required or allowed it. In some cases, changes from Popa’s blueprint, or this thesis initial strategy were based on time constraints. Particularly the non-inclusion of alternative clustering methods besides hierarchical clustering for validation, or the complete inclusion of the additional statistical analysis. Presenting practical sacrifices that needed to be resolved, e.g., by alternative validation methods or the additional use of Excel for further statistical analysis. In other cases, changes were made intuitively, based on experiences gained over the course of more than 100 test trials, which were made possible by specially designed software, readily available high-end hardware, and a relatively manageable number of data and attributes. Throughout these trials, it was possible to evaluate little by little if

[18] Popa (2018, 34) himself emphasised that this applied to several aspects in his own application, e.g., the establishment of the values for the object categories.

certain aspects of the database structure, the software and GUI, Popa's original application, the chosen variables and weighing's needed to be altered or fine-tuned.

Two examples of this are the addition of the value decorated to the clustering process and the extension of the study in the form of the cumulative cluster that incorporates all three cemeteries. Both additions were done since the issue of the relatively low number of burials remained particularly apparent with the initial test clusterings for the individual cemeteries. While even the 40 usable graves, consisting of 47 burials and 327 objects in Oberndorf, were a source of concern at the beginning, they did generate reproducible, plausible clusters that could be partially validated in early test runs. More precisely, from four calculated clusters, two clusters were conceivable. The other two, while to some extent still plausible, highlighted two specific issues. One is the large number of looted burials in Oberndorf, which partially falsified these two early clusters [19]. It was observable that even though the absolute number of objects still had validity, its weighing needed to be reduced in comparison to Popa's application as much as it needed an additional variable to be balanced and put in contrast with. Thus, the number of decorated objects was added as a value included in the algorithm. An addition that was applicable thanks to the high resolution and quality of the provided excavation data.

The second issue correlated with the sample size and stood out early on in these first trials with Oberndorf. Even when clustering such a small number of samples, ideally, at least four non-overlapping clusters would be expected. This leads to a high possibility that there will be clusters with only one or two graves. While methodologically questionable from a data science point of view, such small cluster groups are not arbitrary by default based on their context. One of these clusters discovered early on during the test trials consisted of two distinct graves (54/OBD/04 and 89/OBD/82) that were undisturbed 'cremations' with either no or two objects but were still embedded within a surrounding structure. Based on empirical evidence are many such small clusters representations of unique burial customs. Albeit statistically speaking noise at the beginning, they can also be seen as representations of group identity minorities, particular unique group identity combinations or even individuality. Only grave 8/OSS/69 has been considered an actual statistical noise, since it lacked any information on its 'burial rite', or the graves construction. This missing data was in hindsight considerably more

[19] All three individual cemeteries have a different percentage of disturbed graves. Only the Oberndorf quadruple burial in grave 28 is most likely a multistage funerary reopening with no indication of robbery. Aside from that, Oberndorf has approx. 42.5% of graves that are either definitely or possibly contemporaneously disturbed. Ossarn has a considerably smaller number of approx. 27.27%. In Inzersdorf, all but three of the twelve graves show no evidence of post-depositional interaction, along with two additional graves that remain uncertain (Neugebauer, 1996b). Consequently, approx. 76.47% of all disturbed graves show definitive or very likely signs of contemporary grave robbing, with the remaining grave contexts being inconclusive. Since all three cemeteries are not fully excavated, these numbers should be considered an approx. sample size. By comparison, Pottenbrunn, a more extensively excavated site, has 26.6% disturbed burials, whereas Mannersdorf in the Leithagebirge has 13.5% (Ramsl, 2002; Ramsl, 2011).

problematic for the algorithm then any missing object related variables. Thus, the algorithm could never place it plausibly or recurringly into any group cluster, but almost always considered it its own unique cluster.

These examples show that while a higher amount of data within a single group cluster is always preferrable, such attained small cluster must be analysed before they are considered implausible and accepted if empirically validated and plausible within their context (Gadamer 1989, 267). One means of validation was the partial reasoning behind the cumulative cluster. Since, in theory, these small clusters should reappear based on several further similarities and dissimilarities, even if a larger set of all 74 graves is analysed by the algorithm.

9.2 The Final Clustering Specifications

As stated, the following specifications are based on over 100 test trials. Also, many of these specifications do function within a range, not exact values. The concluding specification for the clustering process were slightly different for the individual and the cumulative clusterings. However, after receiving clear differentiated clusters from the final cumulative clusterings, these specs were tested on all individual cemeteries and did validate the previous clustering results. These small differences will be stated when the individual cemetery clusterings will be described in 12.3.2. The final 'silhouette score' for eight cluster is 0.21 and for six cluster 0.27, while the 'Dunn index' for eight cluster is 0.51 and for six cluster 0.5.

The final cumulative cluster groups that will be presented in short, were produced by the 'hclust' function and the 'Complete Linage' method. The number of clusters differentiated in between six and eight, depending on if the supra-cluster were meant to be differentiated further. For the range of grave similarity weight α, a span from 0.6 to 2.3 produced the most balanced results. For all possible weighing's, general, ritual or object based the values unidentified or unknown were always given the most possible negative value and thus were cancelled out. Besides that, the ritual based values were all kept at 1. With the only exception of *multiple burials*, that for reasons already explained, was tuned down to 0.1.

The grave good-based variables were more intricate. Similar to Popa's observations (page) and own testing's, group identity related clusters did seem to be outlined more clear-cut if the practice based general values for the object *category 1* and particularly *category 2* were weighted slightly more significant than the typology based *category 3* and *category 4*. For that reason, the weight value for *category 1* was changed to 0,95, for *category 3* and *category 4* to 0,9, while *category 2* remained 1. For the variable values of each category a large number of variations was tested. In the end it was decided to not put a higher emphasis on context related values such as weapons or drinking vessels. Such changes did not alter the clusters in any considerable way. Since such values changes felt additionally

like circular reasoning, it was determined to refrain from adding these weighing's to the final clustering procedure. The most essential value changes were related to all objects *categorised* as others, in particular belt components. In general, all the various values other within the four object category were given the most negative value and cancelled out. However, the exclusion of a large number of not conclusive vessel fragments, as much as lost vessels and decayed vessels did falsify the evident number of vessels considerably and unnecessarily. During the testing trials a variety of values were tested to introduce these objects to a lesser extent to the clustering process.

Finally, it was decided to weigh the *category 2* other value vessels and the *category 3* other value vessels fragments as -0.5. The issue of belt components related to a number of small objects, such as attachments similar but not as conclusive as '*Koppelringe'*, that were definitively part of a belt or weapon belt. Albeit not as impactful in the clustering as the larger number of similar small not assignable mechanical components from *category 4* other, they did marginally overemphasise any belt with such components found in a grave. To not lose their emphasise on more complex belts but lessen their impact still significantly both *category 4* values of belts components and weapon belt components were decreased to -0.7. Finally, the only change in *material* was increasing the value of bronze to 0.5, as to slightly signify its well established importance within the Early Iron Age context.

9.3 Description of Results

The final results obtained are based on four individual clustering processes. One for each single cemetery and the cumulative clustering, which incorporated all 74 graves and 88 burials. As stated in the previous chapter, only grave 8/OSS/69 was omitted. Based on the cumulative clustering, which produced by far the most substantial results, six group cluster were produced by the algorithm and consequently reproducible and verifiable. Each of these will be presented in the subsequent section in more detail. Four of these groups are small clusters that present unique grave contexts, or graves that share a specific significant attribute, particularly cremations. The other two larger clusters are considered 'supra cluster'. Both have been conceivably further separated during the test trials by raising the number of possible clusters to eight. Adding another layer of resolution.

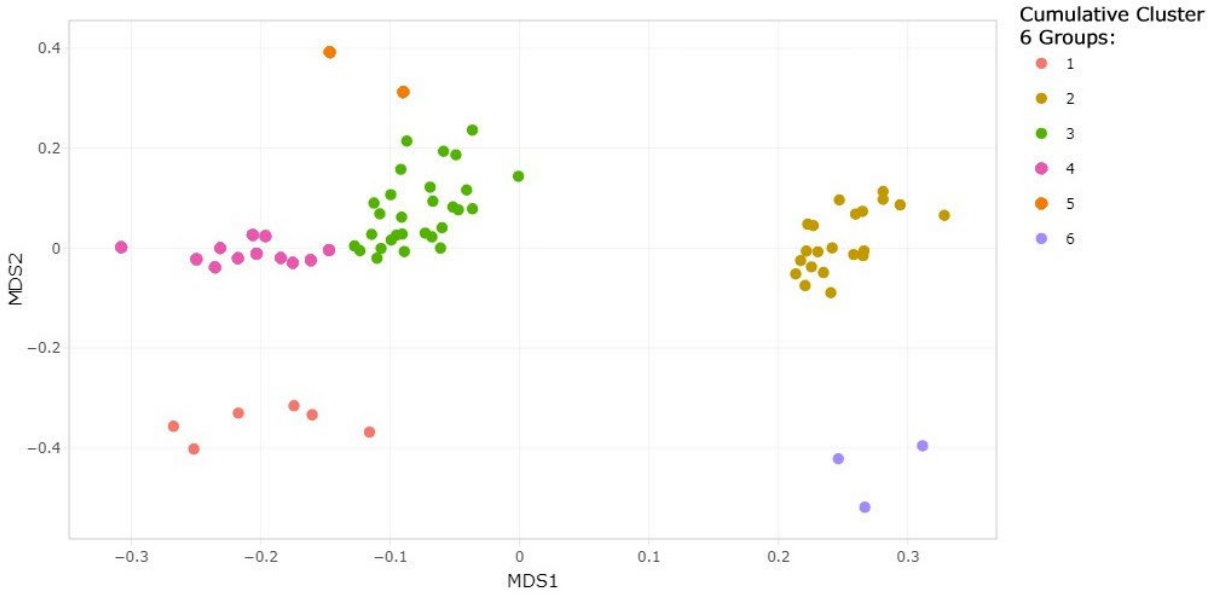


Fig. 15: Scatterplot obtained after the cumulative clustering process with 6 groups.

The cluster groups derived by the cumulative clustering (fig. 15) can be summarized as follows:

Group 1: A group consisting of all six 'cremation' flat graves, that share a low count of *objects*, particularly *decorated* and bronze objects.

Supra Group 2: The 'inhumation' *surrounding* structure group. This group consists of 22 burials that have a high *number of objects*; *decorated* objects, bronze objects and shares 70.83% of all weapons related burial goods. This group can further be divided into two subgroups based on these variables and certain object category dissimilarities.

Supra Group 3: The largest group of 35 burials. It consists of only flat 'inhumation' graves with a generally high to average *object* count, as well as in regard to *decorated* objects and bronze objects. This group shares 48.59% of all vessel and vessel implements, 50.83% of all adornment or clothing accessories and 40% of all tools. This group can also be further divided into two groups, in a similar way as supra-group 2.

Group 4: This group consists also of 14 'inhumation' flat graves and presents a mixture of undisturbed burials with the lowest count of *objects* in any regard and graves that have been disturbed or destroyed to such a significant degree, if compared with all other looted or disturbed graves.

Group 5: Are two unique flat 'inhumation' graves with *multiple burials*, namely the quadruple burial in grave 12/OBD/82 and the double burial in grave 18/OBD/82. Together these six undisturbed burials accumulate 18.78% of all adornments or clothing accessories and 15.56% of all tools, despite only having 5.34% of all objects.

Group 6: Are finally one double and two single ‘cremations’ that are situated within a *surrounding* structure but have a very low number of maximal three *objects* as burial goods.

All four clustering processes have been produced, tested, and validated independently from each other. In some cases, this included plausible weighing differences if needed. Despite this, testing runs showed regularly that most plausible weighing changes and, in some cases, even the omission of certain variable values did not change the fundamental structure of the six clusters obtained by the algorithm. The greatest differences appeared within the middle ground of certain groups. Particularly in between the three inhumation clusters 3, 4 and 5. This aforementioned middle ground, or fuzzy areas, were a recurring ‘issue’ since a small number of graves changed clusters during the trials, often based merely on very slight weighing changes. To remain within Popa’s radio analogy, only after finding the ideal frequency, by eliminating or tuning down all sources of statistical noise, these fuzzy areas have been cleared out to achieve visibly separated clusters.

Nevertheless, such fuzzy areas present an interesting methodological matter. Arguing purely from a clustering standpoint, clearly defined clusters are the ideal, whereas fuzzy areas are considered undesirable (Legány, Juhász and Babos, 2006; Popa, 2018, 88). However, applied to data that conveys perceived group identity or generally data that exists within spectrums, such fuzziness is a representation of reality. In actuality, group identities are never clearly separated from each other, as they intermingle and interact (Popa, 2018, 88). However, the procedures did still produce clearly separated clusters. Indicating that overall, despite infrequent object based similarities with other groups and similar dissimilarities within themselves, the obtained clusters are largely reflections of the burial rituals and grave *constructions*. This emphasis within the clusters remained even when the ritual-related variables *grave type* and *ritual type* were significantly reduced. Showing that within the examined context quantitative and qualitative object-based similarities are to some extend directly related to ritual-based similarities.

9.3.1 The Cumulative Clustering of the Entire Data Set

As stated, the cumulative clustering did produce the most substantial clusters. All six clustering groups are evident within the individual cemetery clusterings. This is also true for the subgroups obtained by further dividing both supra groups 2 and 3. For this reason, the primary description of the results will be based on the final cumulative clustering results, whereas within the sections of the individual cemeteries, the focus will remain on their differences and peculiarities.

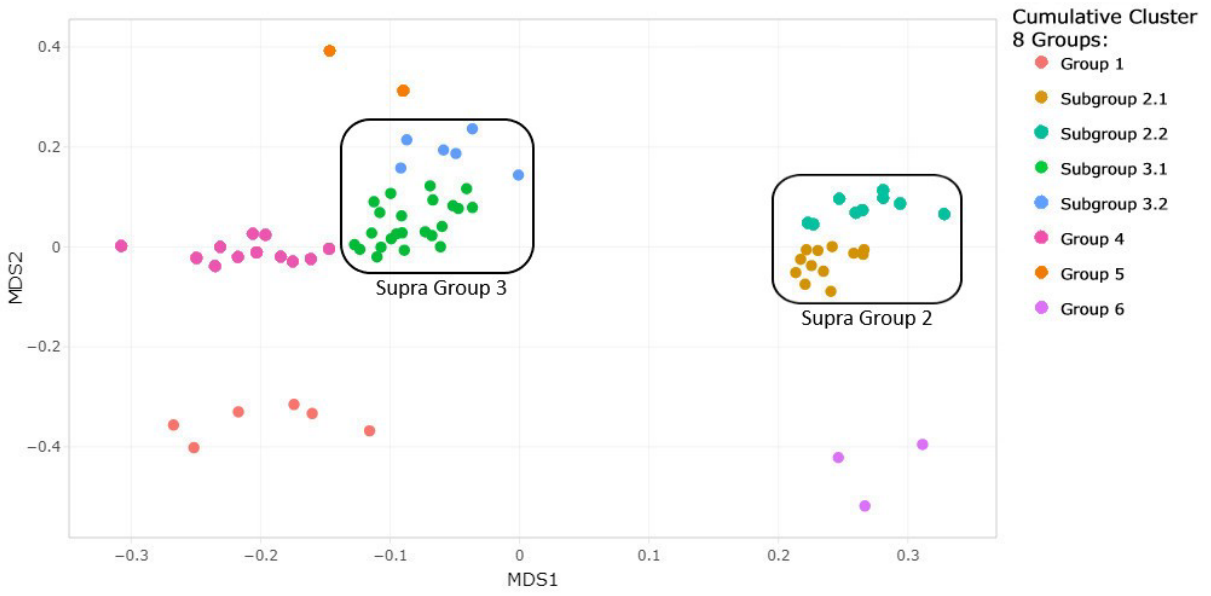


Fig. 16: Scatterplot obtained after the cumulative clustering process with 8 groups. The two Supra Groups 2 and 3 are highlighted.

9.3.1.1 Group 1

Group 1 is made up entirely of six flat 'cremations' in Oberndorf. This group is the one with the most dissimilarities within its own group. One difference lay within their dominant object *categories* and the *number of objects*; another was distinct differences in the cremation remains *deposition type*, with two being deposited within ceramic urns along with four unseparated cremations, one of which was unique in itself. These dissimilarities can be observed both in the scatter plot and the dendrogram, as group 1 could theoretically be separated further into two subgroups based on these differences. Albeit such a further separation seemed unnecessary in relation to the low number of graves and the dissimilarities to the other clusters, it is observable within the *number of objects*. With one subgroup consisting of three cremations containing twice seven and once nine objects, and the other consisting of three cremations containing once three and twice one object.

The first theoretical subgroup is specifically distinctive for two outlier burials, namely grave 3/OBD/82 and grave 5/OBD/82. These two graves are unique not only in their ritual and object combinations within group 1 but within the whole data set. Grave 3 has a distinct emphasis on offensive weapons, having, i.a., one javelin head type 1 and two javelin heads type 2 as well as a richly decorated belt hook type 1 with a box belt plaque and a still attached '*Koppelring*' as part of its burial goods set. Additionally, the ashes from this grave were deliberately placed in a specific area at the top left. The other outlier grave 5, albeit less unique, had an emphasis on tools, with two knifes, one of which was a potential folding knife type 3, along with an awl or awl like perforating tool. The third grave of this subgroup, grave 33/OBD/04, had an object composition more similar to the 'inhumation' groups 3 and

4. Presenting a balanced composition, with a slight emphasis on vessels. All three burials are those 'cremations' with the highest *number of objects* in the whole data set.

Despite their differences, the six graves are grouped together not by chance, but because of their concurrent similarities. Besides the base ritual and grave type, is the *number of objects*, by comparison, still relatively low, even with the highest number of nine objects. Even more similar is the noticeable complete lack of any bronze object and the small number of *decorated* objects, with a maximum of three in grave 33. Five of the graves were definitely not looted, only grave 35/OBD/04 was potentially looted contemporarily. Except for graves 35 and 77/OBD/04, which could not be dated precisely beyond HA D - LT B, the remaining burials are all dated in LT A.

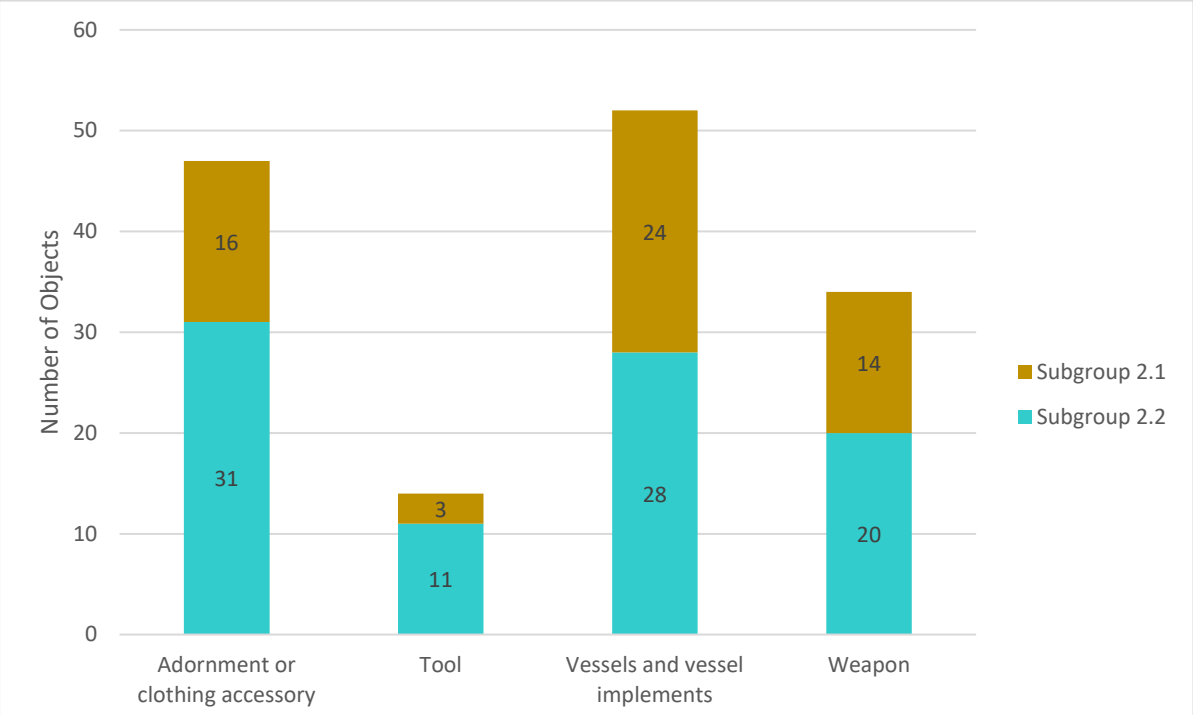
Considering their nature as 'cremations', the *sexes* of the buried individuals were undetermined. *Age* had been confirmed for at least half of the 'cremations', with graves 3/OBD/82 and 5/OBD/82 being adults and burial 35 containing a child.

9.3.1.2 Supra Group 2

The first supra group 2 consists of 21 'inhumation' graves that are all located inside a *surrounding construction* and stem from all three locations. Since grave 15/OBD/82 is a double burial, this group consists of 22 individual burials. The division into subgroups by the algorithm is based on the *number of objects*, *decorated* objects, and bronze objects, as well as the *object categories*. There are 175 *objects* in the supra-group, 73 of which are *decorated*. The distributions of either, the overall *number of objects* or *decorated* objects, between the two subgroups is analogous. Whereas subgroup 2.1 has 37.71% of all *objects* and 34.25% of all *decorated* objects, subgroup 2.2 has 62.29% of all *objects* and 65.75% of all *decorated* objects. Eight graves from subgroup 2.1, but only two graves from subgroup 2.2 have not a single bronze objects among their burial goods. Suggesting a difference in material wealth between both subgroups. This disparity is even more evident if put in contrast with another difference; the ratio of looted graves to not looted graves. A total of 11 graves looted contemporarily with grave 31/OBD/82 being probably looted contemporary. Only three of these graves that are definitely looted contemporarily stem from subgroup 2.2. This ratio coincides with the number of not looted graves. Of those 8 graves without any sign of lootings, are six from subgroup 2.1, and only two are definitely not looted from subgroup 2.2. For two graves of subgroup 2.1, both from Inzersdorf no definitive statement for either could be made. Demonstrating that the above stated ratios of *number of objects*, *decorated* objects, and bronze objects remain contrasting to such an extent even if 8 out of 10 graves from subgroup 2.2 are looted contemporary.

Of all graves within this supra-group, 13 burials are either biologically probably or definitely male, whereas five are determined to be either probably or definitely female. Only one female burial (272/INZ/87) is part of subgroup 2.1, whereas in subgroup 2.2, the sex ratio is distributed evenly, four

to four. All five female burials are among those that are definitely looted contemporarily. By contrast, only six male graves are looted contemporarily, four definitely and one probably, three in each subgroup respectively. For further four burials, no *sex* could be determined. Two of these are an infant and a child. In regard to *age*, the trend is somewhat more balanced. The majority of burials are either young or middle adults. With six burials being young adults, four in subgroup 2.1 and two in subgroup 2.2. In contrast, nine burials were determined to be middle adults, four from subgroup 2.1 and five from subgroup 2.2. All other age categories are evident at least once. It is noteworthy that the form of the *surrounding* structures is somewhat evenly distributed, with subgroup 2.1 having five square *surroundings* and seven circular surroundings and subgroup 2.2 having six square and four circular ones. However, all graves within Inzersdorf's prominent quadruple circular surrounding system (see Fig. 31) are part of subgroup 2.1.



Category 1 Object Distribution of Supragroup 2

Vessels and vessel implements are the object category that appears to be the most balanced between the two groups. Both groups have 11 storage and transport vessels each, whereas subgroup 2.1 has 9 and subgroup 3 has 10 vessels for eating and cooking. The largest dissimilarity lies within drinking vessels, with only 4 of the 11 being found in subgroup 2.1, and the remaining 7 vessels being from subgroup 2.2. Additionally, 13 vessels that were either lost, or only remained fragmented have been documented for both groups. The remaining object categories showed significant differences in distribution or object categories (diagram 1) and will be described in their following sub-sections.

9.3.1.2.1 Subgroup 2.1

This subgroup consists of 12 graves, 7 from Inzersdorf, 4 from Oberndorf, and grave 25/OSS/63, which is the single grave with a *surrounding* structure from Ossarn. Besides the above stated aspects, this group differentiates itself from subgroup 2.2 largely based on object related similarities. In any *category 1* object category, this subgroup has a significantly lower *number of objects*, despite consisting of more burials that are less frequently looted contemporarily (table.). Only four burials had a fibula added to their grave inventory. Albeit the weapon related object ratio was more balanced in comparison to subgroup 2.2, the weapons themselves did show a differentiating trend. Seven out of four javelins were part of this subgroup, along with two additional spears and not a single sword. Only one of these graves was looted contemporarily. The infant in grave 287/INZ was the only burial with two bracelets. Five burials had a belt hook type 1 with a box belt plaque. The single one of these that could be identified as a weapon belt hook type 1 was grave 27/OBD. Only two further burials had a simple belt hook type 2, one of those was part of a weapon belt in grave 270/INZ. All of these belt hooks are made out of iron. Grave 272/INZ was the only burial that had a carving knife type 1 and animal bone offerings added to its inventory [20].

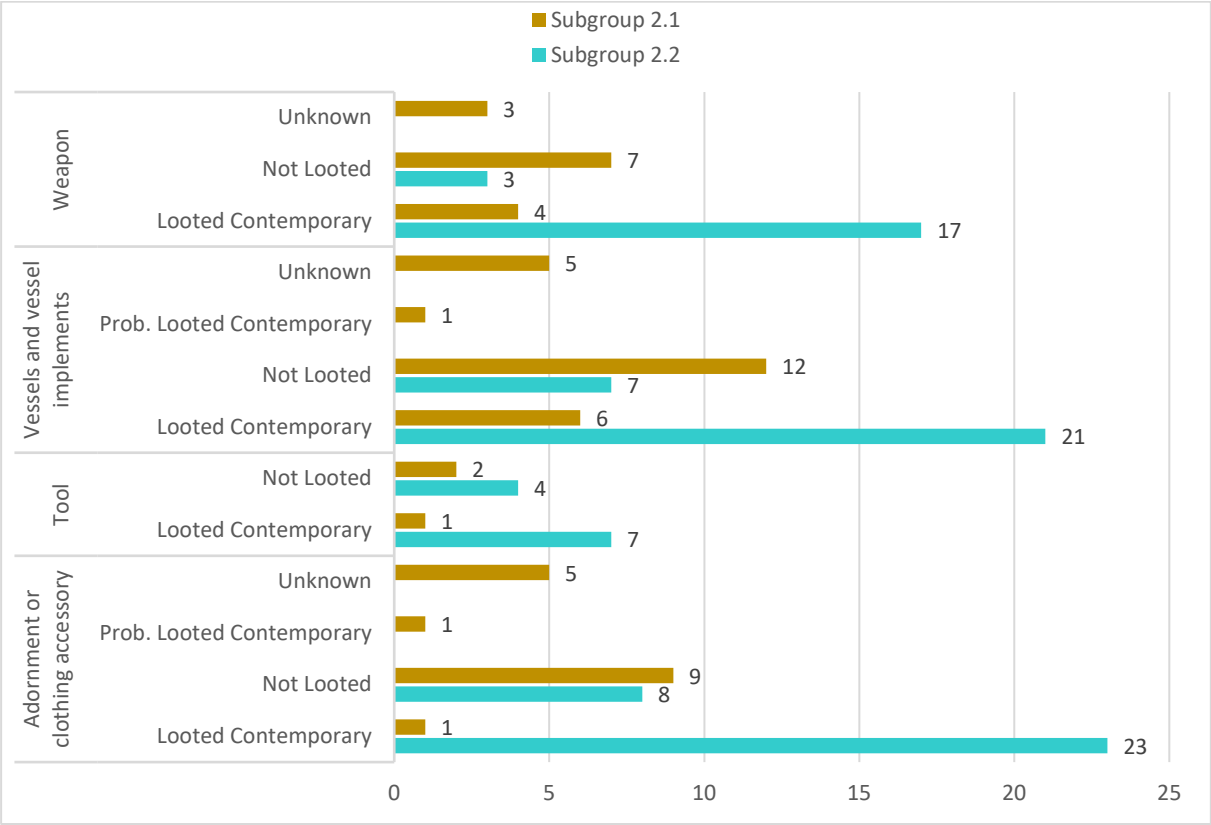
9.3.1.2.2 Subgroup 2.2

Subgroup 2.2 contains nine graves and ten burials, since grave 21/OBD/ is a double burial. Even after splitting the supra-group, this subgroup remained the overall group with the highest amount of 41.67% of all weapon related objects. This number stands despite this group's small number of ten burials, eight of which were looted contemporarily (diagram 2). Eight of these objects are components of weapon belts, such as '*Koppelringe*', while three are belt hooks from weapon belts, one is a belt hook type 1 with a box belt plaque, and two are openly worked belt hooks type 3. All these belt hooks and components are iron objects. In regard to offensive weapons this group does have four further javelins. One being a rare, decorated javelin type 4, along with an additional javelin fragment within the female grave 37/OBD/04. Besides a lost sword noted for grave 9/OBD/82, two spears were found in Inzersdorf, in graves 279 and 277. The latter is significant because it was discovered in conjunction with the only spear ferule in this thesis data set, both of which were *decorated*.

This subgroup contains a significant number of 31 adornments or clothing accessories related objects. Among these are toiletry objects, such as a nail clipper in grave 279 and a combination of a nail clipper and a tweezer in grave 9. Most numerous are 10 fibulae; among these is a special variant of a Certosa fibulae found in grave 277, as well as three *Vogelkopffibeln* (fibulae type bird head) and three *Fußzierfibeln*. Four individuals were buried with bracelets type 4, one of which was fragmented. Seven

[20] To be precise, domestic pig bones (Neugebauer, 1996b, 128)

graves had knifes added to their inventory. Four of these are various knife types, while four others carving knifes type 1, with grave 37 having both. Overall, all graves besides the *multiple burials* in grave 31/OBD had animal bones added as *offerings*.



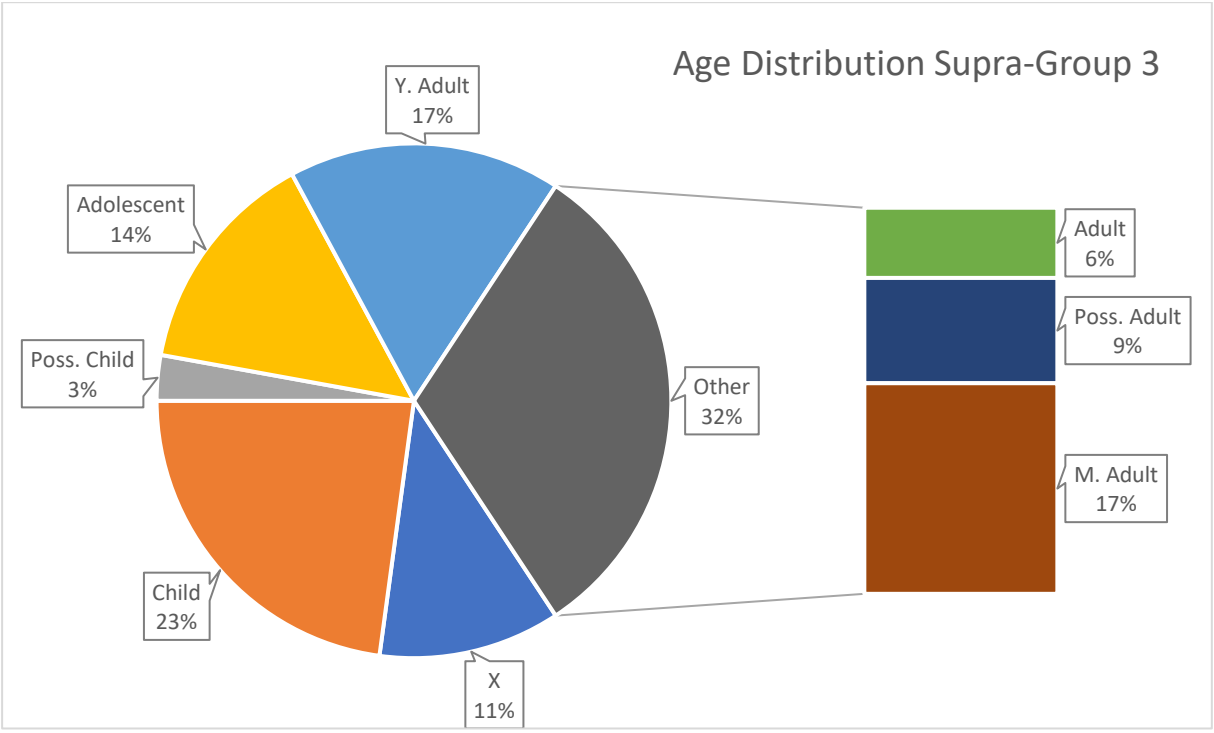
9.3.1.3 Supra Group 3

The second supra-group contains 29 graves and is the largest group. These include 31 'inhumations' and 4 'cremations'. Four graves have *multiple burials*. Graves 25/OBD/84 and 4/OSS/66 have each two flat 'inhumation' burials. More prominent are grave 44/OBD/04 with one adult female 'inhumation' and a 'cremated' child, and grave 6/OSS/84 where a young adult female individual was buried along with three 'cremations', one possible child, another that is possibly female and possibly adult and a completely undeterminable individual. Making a total of 35 buried individuals, 18 in Oberndorf and 17 in Ossarn. Only six of these burials are part of subgroup 3.2. 22 burials are *dated* LT A, seven between LT A - LT B or B1. Grave 121/OBD/82 is likely the oldest, being dated between HA D3 - LT A, whereas grave 4 is the youngest, being dated into LT B1.

As with supra-group 2, the division into two subgroups is based on the *number of objects*, *decorated* objects, and bronze objects, as well as the *object categories*. There are 246 *objects* in total, with 88 of them being *decorated*. Despite consisting of only 17.14% of all buried individuals in the supra-group, subgroup 3.2 still has 35.92% of all *objects*, 43.68% of all *decorated* objects, and 49.09% of all bronze objects. Again, presenting a further subgroup division based on material wealth. However, the

respective number for contemporary lootings, albeit neither mitigating nor confirming this division in the same way as in supra-group 2. In subgroup 3.2, not a single burial was definitely looted contemporarily, with only the child burial 13/OBD/04 being probably looted contemporarily and grave 121 showing no clear sign either way. Subgroup 3.1 has three graves that were looted contemporarily, six graves that were probably looted contemporarily, four graves for which no clear statement could be made, and the remaining 16 graves that were not looted.

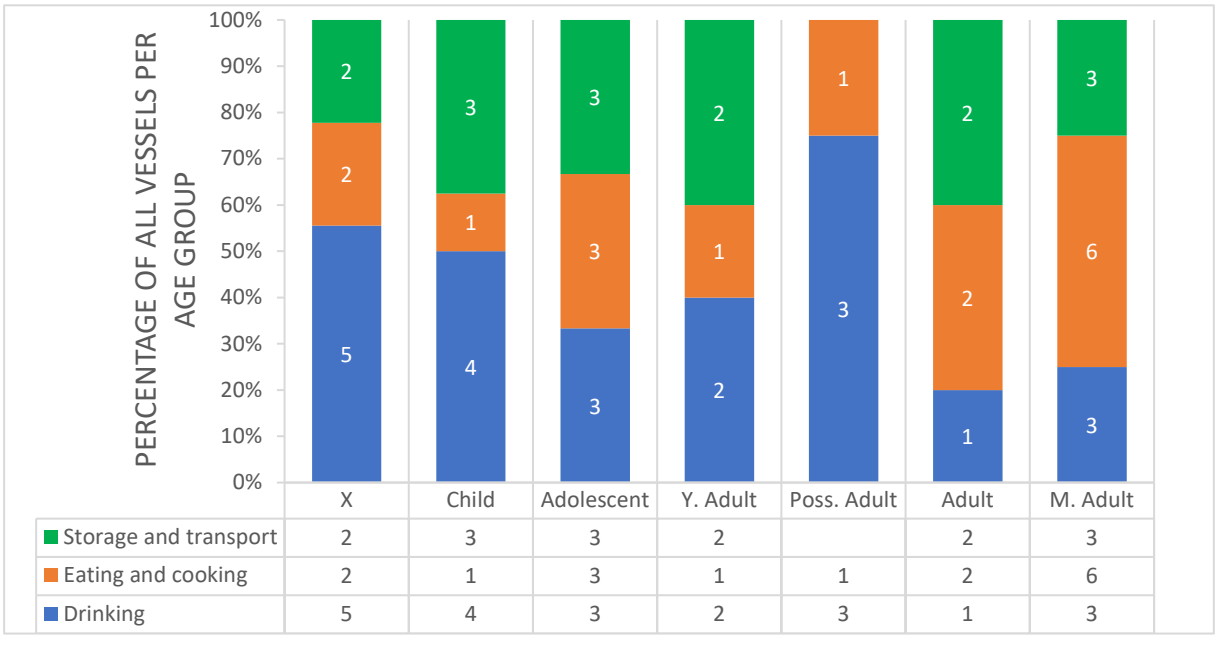
The sex ratio in between the subgroup is relatively balanced. Subgroup 3.2 only has one definitive male and female burial, while subgroup 2.2 has each seven individuals for both biological *sexes*. Further, one burial in subgroup 2.1 is probably female, with two graves being the same in subgroup 2.2 along with one that is probably male. The largest proportion of 15 burials within both subgroups are undetermined *sex* wise. This leads to a conspicuous feature of both subgroups, since 8 of these 15 burials are child burials, along with one possible child, three adolescent burials, and three that are not determinable *age* wise either (diagram 3). There are eight child burials in total, accounting for 22.86% of all supra-group burials, with one additional possible child accounting for another 2.86%. Young and middle adults are each six individuals, or 17.14% of all burials. Five adolescent individuals make up of 14.29% of all burials, with another two burials, or 5.71% being adults, and three burials, or 8.57% being possible adults. There are four not determinable burials in total. Showing, that 57.15% or 20 burials were either definitely or probably under 35 years of age at the time of death, and 40.01% were even under 20 years of age. These numbers more or less remain consistent in the subgroups, as the smaller subgroup 3.2 consists of two children and two young adults each, as well as one adolescent and one middle adult respectively.



9.3.1.3.1 Subgroup 3.1

The 29 burials within the subgroup are just about evenly distributed between Oberndorf with 14 and Ossarn with 15 burials. This group shares 120 objects, with the large majority of 52 being adornments or clothing accessories and 55 being vessel and vessel implements. Whereas 29 objects are part of *category 1* other and 9 are unidentifiable objects. Only nine objects, spread over eight burials, are part of *category 1* tools. All these tools are knives of varying types, with type 6 being the only one that occurs three times. Seven graves have one type each, with grave 7/OSS/84 having both a knife type 6 and a knife type 9. There is not a single carving knife within this group, despite 16 graves having animal bone *offerings*. Even a smaller number of two graves, 13/OBD/82 and 13/OSS/84 have evidence for *category 1* weapons. More precisely, a belt hook type 1 with a box belt plaque along with a '*Koppelring*' in grave 13/OSS and two javelins, one type 2 and another type 3 in grave 13/OBD. Both buried individuals are male. One is probably (13/OSS) and the other definitely (13/OBD) looted contemporarily.

Of those 55 vessels and vessel implements, there are 38.18% drinking vessels, 29.09% eating or cooking vessels, 27.27% storage and transport vessels, and three urns, one from grave 44/OBD and two from grave 6/OSS. Additional 14 lost vessels or fragmented vessels are from *category 1* others. The *category 2* vessel categories are mostly evenly distributed over the *age* and *sex* groups. The outliers are middle adults who have 3.50% of all subgroup eating and cooking vessels, or more precisely male middle adults with 25%. 19.05% of all drinking vessels are part of a child burial, while those burials whose *age* or *sex* could not be determined have 14.29% of all drinking related objects (diagram 4). There were no more than three vessels per *category 2* in any grave. Only graves 19/OBD/82, 26/OBD/82, 5/OSS/84 and 28/OSS/84 each had a drinking, eating or cooking and storage vessels in their burial goods inventory.



	X	Child	Adolescent	Y. Adult	Poss. Adult	Adult	M. Adult
Storage and transport	2	3	3	2		2	3
Eating and cooking	2	1	3	1	1	2	6
Drinking	5	4	3	2	3	1	3

Regarding the 52 adornments or clothing accessories, 38.46% of these are fibulae, 26.92% are belt components, and 25% are bracelets. Each a single anklet, bead necklace, dress pin, earring, and finger ring are additionally evident in the subgroup. The majority of *category 3* belts consists of nine belt hooks type 1. Bracelets are evident in variety of types and states of preservation. Overall, ten bracelets were added to female burials of all *ages* present in this supra-cluster, besides children. All these ten bracelets are made of bronze. Whereas *male* burials have no bracelets, in those graves where *sex* was undeterminable, an adolescent burial had another bronze bracelet, and a child burial had an iron bracelet. Finally, grave 28/OSS/85, which has no determinable *sex* or *age*, has two iron bracelets. Among the fibulae, a number of types are only evident once, all made of bronze: a Certosa fibula, a *Doppelpaukenfibel* type Speikern, a fibula type Duchcov, and a special variant of a wire fibula. Aside from these, as well as three bronze Marzabotto fibulae and three iron fibula fragments, the majority of the fibulae are nine *Vogelkopffibeln,* two of which are iron, and the rest are bronze. The majority of graves only have one single fibula in their inventory, with graves 5/OSS and 16/OBD having each two different types and grave 20/OSS/84 having two *Vogelkopffibeln*, one bronze and one iron, with the aforementioned special variant wire fibula as a third fibulae. The most significant burial in this regard is that of the adolescent female individual in grave 19/OSS/84 who had only hat seven *objects* overall, three of them being bronze *Vogelkopffibeln* with an additional bronze fibula chain.

9.3.1.3.2 Subgroup 3.2

The significantly smaller subgroup 3.2 consists only of six individuals, four of whom buried in Oberndorf and two in Ossarn. As previously stated, these six individuals account for 88 of the 256 *objects*, or 43.68% of all *decorated* objects. *Sex* and *age* wise, this group is relatively mixed, with graves 1/OSS/66 and 13/OBD/04 being undeterminable child burials, grave 17/OSS/84 being an undeterminable adolescent, a probable female middle adult individual in grave 29/OBD/82, and two young adults, one male in grave 21/OSS/84 and a female in grave 121/OBD/04.

39 of the 88 *objects* are in *category 1* adornment or clothing accessories. Although, ten of these are beads, six glass beads, two layered eye beads, and each an amber and bone bead, that were likely part of bead necklaces. Similarly, as in subgroup 3.1 are only nine *objects* that are related to tools, and only four weapon related objects are part of this groups inventory. Another 19 objects are part of *category 1* others and 3 being unidentified. The most significant difference between subgroups 3.2 and 3.1 is the relatively small number of 14 vessels and vessel implements. Keeping in mind that the subgroup only consists of six individuals, it is particularly the high number of *decorated* adornments or clothing accessories that stands out.

The four weapon related objects are all part of the young adult male in grave 21. Displaying rare evidence of a now lost sword type 1, as well as a weapon belt hook type 1 and two '*Koppelringe'*. The same individual also has a knife type 2, and the only cast residue within the whole data set. The middle adult probable female buried in grave 29 had four of the nine tools, one knife type 7 and three different types of spindle whorls as part of her inventory. The child in grave 13 has a similar combination, with a knife type 4 and a spindle whorl type 1. Whereas half of the six burials have animal bones as *offerings*, the adolescent in grave 17 is the only person in the entire supra-group 3 who has a carving knife. The majority of nine vessels are from *category 1* others, with eight of them being storage and transport vessels. By comparison, only four drinking vessels and two eating and cooking vessels are present in this subgroup. Four of the six individuals only showed evidence for a maximum of three vessels, including those in *category 1* other. Grave 17 contained five vessels, three of which are from *category 1* other, and each one vessel from *category 2* drinking and eating and cooking. The statistical outlier is again grave 29 having a significant number of eight vessels, four storage vessels, two drinking vessels, and one each from *category 1* other and from the vessel *category 2* eating and cooking.

As for the 39 objects in the *category 1* adornment or clothing accessories, 11 are fibulae, 6 are belts and bracelets respectively, along with 3 rings, 2 anklets, a single choker necklace, and the aforementioned 10 beads. Only grave 21 had a single iron fibula fragment, despite not being looted. All other burials had at least five adornments or clothing accessories added to their inventory. The child in Grave 1 showed the greatest variety, with two *undecorated* iron belt hooks of type 1 and type 4, four glass beads, two layered eyed glass beads as well as one bone bead, a bronze fragmented bracelet type 6 and a bronze *Doppelpaukenfibel* type Speikern. Grave 17 exhibits a similar range, with a *decorated* bronze belt hook type 1, with two additional beltcomponents, as well as one figural fibula, one *Vogelkopffibel*, a necklace type 4 and fingering, all made of bronze, and a single glass bead. Grave 29 had two iron objects: an *undecorated* belt hook type 1 and a fibula fragment, along with three bronze objects: two bracelets type 4 and a single *Vogelkopffibel*. The female grave 121 contained both *decorated* bronze anklets and both bronze fingerings, with two additional *undecorated* bronze bracelets and a *Paukenfibel,* type Weidach. Finally, the second child burial in grave 13 received a considerable number of four bronze fibulae, two fibulae type Marzabotto, one *Vogelkopffibel* and one fibula fragment, with two additional beads, another one out of glass and one out of amber.

9.3.1.4 Group 4

This group consists of 12 graves and 14 burials, as graves 15 and 18, both from Ossarn 1984, are *double* burials. Since group 4's primary characteristics are the lowest *number of objects*, or *decorated* objects, of all flat 'inhumations', it can be seen as a catch basin for graves that have these attributes in common, regardless of the reason. Thus, technically, group 4 consists of two hypothetical subgroups: one that consists of nine flat 'inhumations' with the least *number of objects* of this ritual type, but with a

different state regarding contemporary reopenings. Only graves 2/OSS/66 and 118/OBD/82 show at least probable signs of contemporary looting. No clear statement in that regard could be made for graves 16/OBD/12, 30/OBD/82 or 8/OSS/84. The remaining four burials showed no signs of any contemporary looting or disturbance. It should be noted, however, that the majority of graves analysed for this thesis that were looted contemporarily, still accommodate a representative *number of objects* that reflected their respective cluster groups. The second theoretical subgroup includes three graves from Ossarn that were destroyed during excavations or construction campaigns but still had enough documented information to justify their inclusion in the analysis. These graves include the aforementioned *multiple burials* along with grave 23/OSS/84, a female individual that was buried inside a wooden coffin. During the test trials, particularly the *double burials* in graves 15 and 18 were consistently clustered within the fuzzy area between group 4 and supra group 3. However, because their integration is still methodically debatable, and because of the limited value of information contained in these graves in comparison to their pre-destruction state, they will not be evaluated in any significant way for the final interpretation.

Aside from the aforementioned destroyed burials, five group 4 graves can be found in Oberndorf and four more in Ossarn. The *age* of most buried individuals had been estimated. However, their *sex* could only be determined for four of the nine non-destroyed burials. This includes three male individuals, one young adult in grave 118, one adult in grave 7/OSS/66 and one middle adult in grave 16/OBD/82, as well as a disturbed possible adult female burial in grave 2. Five further individuals are an infant (grave 8), two children (graves 16 and 30), an adolescent (grave 78/OBD/82), each undetermined *sex* wise, as well as the individual in grave 22/OSS/84 for which neither *age* nor *sex* could be determined. Regarding the destroyed *multiple burials*, in grave 15, there was another adult, probably female individual, and an adolescent whose *sex* could not be determined. Grave 18 was the initial final resting place for two male individuals, one adult and another middle adult. Finally, the female individual in grave 23 was a young adult. As a result of their low object number, and in some cases, disturbed or destroyed contexts, *dating* was an issue for many of these graves. Grave 2 was on the brink of exclusion as it is among the oldest graves, dating between HA C - HA D. The second oldest burials are graves 30 and 16 as they have been dated in between HA D3 - LT A. The remaining burials could not be dated with particular precision due to the aforementioned issues. For this reason, are graves 7, 15, 18, 22 and 23 dated between LT A - LT B and the remaining graves 8, 16, 78, and 118 are dated only between HA D - LT B.

Apart from the three destroyed graves, only 19 overall objects are evident within the remaining nine burials. Only six objects had any *decoration*. The only bronze object is an unidentified sheet-like fragment found inside grave 118, which was probably looted contemporarily. Of those 19 objects, the majority are 10 vessel, or shards that are part of the *object category* other: five larger inconclusive

vessel fragments, three convolutes of smaller fragments and two lost vessels. Two burials only had vessels of *category 1* others, that being the male adult in Grave 7, with three inconclusive fragments and the adolescent in grave 78, whose burial inventory only consists of a single lower vessel fragment. The probably contemporary looted adult female burial in grave 2 was the only burial that had a tool added as a burial gift. More precisely a knife type 4, along with two inconclusive vessel fragments. The undeterminable individual in Grave 22 is the only burial, apart from the destroyed graves, with any adornments or clothing accessory, and the only one in the whole group 4 with a belt hook. In this case, a type 1 iron belt hook. Besides two unidentifiable metal objects, the already mentioned bronze fragment in grave 118 and an iron fragment in grave 8, all remaining burials had nothing but up to three vessels in their burial goods inventory. Of these, only grave 30 had an eating or cooking vessel, along with a small storage and transport pot and an inconclusive lower vessel fragment. Similarly, only grave 8 had a small drinking bowl, along with a small pot for storage and transport, whereas grave 16 has the third, this time a large storage pot along with a single upper vessel fragment.

9.3.1.5 Group 5

This group is the smallest, consisting only of two very unique flat 'inhumations' with *multiple burials* from Oberndorf, namely the quadruple burial 28 and the double burial 18, both excavated during 1982. These two graves were clustered together continuously based on the high *number of objects*, *decorated* objects, bronze objects, and similar *object categories*. Even in test trials, that negated the weight of *multiple burials* entirely. As already stated, when the Oberndorf data was briefly described, the unique quality of Grave 27 is based on its burial context. Here, one probably male young adult, the only one whose *sex* had been *determined,* and an adolescent individual have been buried directly above one child and another adolescent. These two lower skeletal remains were found in somewhat anatomic positions, except for their skulls, which were placed at the feet of their respective burials above.

Grave 18 is less unique in general, but within this thesis data set, as this undisturbed double burial has been the initial final resting place for two female adolescent individuals, that share the highest amount of burial goods overall. As grave 18, both burials contain 37 *objects*, 22 of which are *decorated* and 17 of which are bronze. Even individually, these two burials are either the first (Burial ID. 10) with 21 or the third (B. ID. 9) with 16 overall *object numbers*, with only grave 29 of subgroup 3.2 with 20 objects being between these two [21]. Regarding the overall number of *decorated* objects, both burials are even individually *ex aequo* in the first place, with 13 *decorated* objects each. Despite having fewer objects for each of the four burials, grave 28 still shares 22 objects, 10 of which are *decorated* and 11 made of

[21] Grave 29 and grave 17 of the same sub-group did have a different composition of object categories, as stated above.

bronze. Only two objects belong definitely to the young adult, based on the received documentation, and seven objects, five being *decorated*, to the upper adolescent. The lower adolescent has eight objects, four of them *decorated*, and the lower child has five objects with one *decorated* object among them. All individuals of this group are dated between LT A - LT B1, but only the two upper individuals in grave 18 are dated into LT A.

Apart from the large *number of objects*, *decorated* objects, and bronze objects, both graves also share a high number of adornments or clothing accessories, with 20 in grave 18 and 14 in grave 28, as well as a comparatively low number of vessels and vessel implements. While grave 18 has only six vessels, with one additional ceramic fragment and one lost vessel, these six vessels are distinctive. Besides two eating bowls and a drinking beaker, this uniqueness is based on the remaining three drinking vessels: a bottle like vessel type HU 1a and two particularly richly decorated pouring vessels, a '*Linsenflasche*' (lenticular bottle) type HU 1c and a situla like pot type Ho 2, both of which are their only kind within the whole data set. Grave 28 shares this low number of vessels, with one lower vessel fragment of *category 1* others and only two further vessels. These vessels, however, are less unique, with one bowl type BW 1 for eating and cooking and a small pot type Ho 2 for storage and transport.

The most similarities are found in *category 1*, adornments or clothing accessories. Not only do they share a similar number of bronze fibulae, with five in grave 18 and four in grave 28, but four of those are Marzabotto fibulae in both graves, respectively. Similarly, both graves had a variety of bracelet types added to their burial goods inventory: five bracelets all made of bronze in grave 18 and four bracelets, three of them bronze and one iron, in grave 28. A further similarity from *category 1*, adornments or clothing accessories, are two rare amber objects in both graves: a bead in grave 18 and a pendant in grave 28. Another similarity is their relatively small number of tools in relation to their high number of adornments or clothing accessories. However, when compared to all clusters, this low number within only two graves is still 15.56% of all tools. In total, these are seven objects, four are all from *category 2*, cutting: one carving knife and a miniature adze from the lower adolescent individual in grave 28, along with another carving knife, a knife type 5 and three spindle whorls in grave 18. The only weapon among all six burials is a javelin type 2 that was found at the southern corner, left of the upper adolescent individual's head.

9.3.1.6 Group 6

The final cluster is rather straightforward. It consists of three graves, all four 'cremations' buried within a rectangular *surrounding* structure, all four being unseparated 'cremations'. Grave 282 is located in Inzersdorf and is a double 'cremation'. Both individuals have been anatomically determined as two males: one middle adult and one adolescent. The remaining two 'cremations' are both from Oberndorf. An infant buried in Grave 89 and an individual for whom neither *sex* nor *age* could be

determined is buried in grave 54. Both 'cremations' from Oberndorf could not be *dated* more precisely than between HA D - LT B, while the Inzersdorf double 'cremation' could be narrowed down to LT A due to a *Vogelkopffibel.* Grave 54 is completely objectless, while grave 89 only has two objects: one open bracelet type 4 made of bronze and a lost vessel. Besides the aforementioned bronze *Vogelkopffibel*, the individuals in grave 282 had been given a bronze dress pin and an iron nail clipper as their burial goods.

9.3.2 Individual Cemetery Cluster

As stated, the individually derived clusters are, for the most part, almost identical to the above presented cumulative cluster groups. Any cluster obtained in the cumulative clustering is visible and reproducible in all four clustering procedures if graves that share similarities with any cluster are present in either of the three cemeteries. Most differences occur when graves within the fuzzy areas switch groups because they are now missing similar graves from the other cemeteries. These changes do not change the results in any significant way, but rather reinforce the relative nature of identity functioning within a spectrum.

9.3.2.1 Oberndorf

The final Oberndorf cluster groups are almost identical to the cumulative clustering, whether six or eight clusters were produced. Almost, since in both cases a small group of graves in the larger flat 'inhumation' clusters, subgroup 2.2, and group 4, were slightly differently arranged. When computing 6 cluster, supra-group 3 incorporated group 4 as a subgroup, instead of subgroup 3.2, which consequently became its own group. Such changes are based on the algorithm's automatic numbering of clusters, which is based on the sequence of occurring dissimilarities during their computing. In this case, in absence of the Ossarn supra-group 3 graves, the Oberndorf subgroup 3.1 burials are now more similar to group 4 than to those of the cumulative subgroup 3.2. Specifically, within the fuzzy area between either of those three flat 'inhumation' groups. When these clusters were further differentiated into eight cluster this slight regrouping remained the same. With the exception of the aforementioned subgroup switch and four graves that shifted from subgroup 3.1 to the former subgroup 3.2, these eight clusters are identical to the cumulative cluster groups. The only change in the specification was a decrease in the range of grave similarity weight α, from 0.6 to 2.3 to 0.6 to 2. This was done to slightly compensate for the large number of contemporary looted graves. If six clusters were obtained the results had a 'silhouette score' of 0.28 and a 'Dunn coefficient' of 0.47, while eight clusters provided a 'silhouette score' of 0.23 and 'Dunn coefficient' of 0.48.

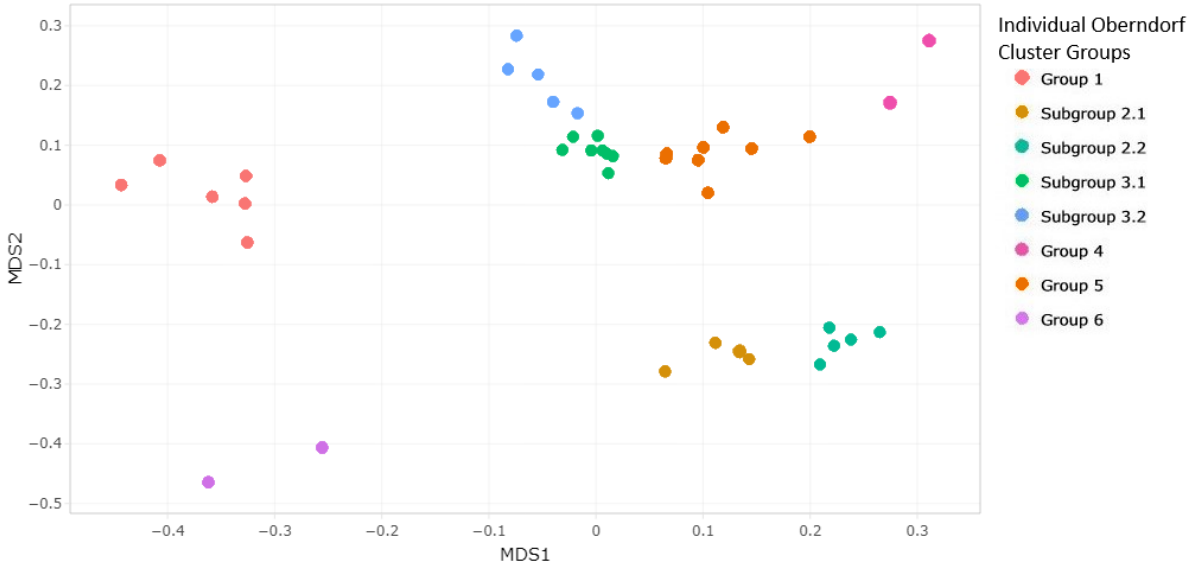


Fig. 17: Scatterplot obtained after the individual Oberndorf clustering process with 8 groups. In Oberndorf supgroup 3.2 equals the cumulative cluster group 4, and vice versa.

Based on eight calculated clusters, the results summarized are as follows: group 1, supra-group 2, group 5, and group 6 are all identical to their cumulative counterparts. Supra group 3 has the most changes as described above. This supra-group now consists of subgroup 3.1 and the former cumulative group 4, which stayed identical apart from this. Only four graves moved groups from subgroup 3.1 to subgroup 3.2. These are the single 'inhumation' flat graves 19 and 26, both excavated in 1982, as well as the *double* burial 25 also from 1982 and the 'inhumation', 'cremation' *double* burial in grave 44 from 2004. These graves all have an object number of at least 11 and minimally 9. In its local variation, subgroup 3.2 has now become its own group 3.2 [22] and even the largest group in Oberndorf consisting of 10 burials and has 30.46% of all *objects*, the majority of 30.65% of all *decorated* objects, and 29.58% of all bronze objects in Oberndorf. By comparison, the six burials of group 5 still have 18.15% of all *objects*, 25.81% of all *decorated* objects and the majority of 39.44% of all bronze objects, while the ten burials of the *surrounding* structure supra-group 2, of which four are definitely looted contemporarily, have 27.08% of all *objects*, 25.8% of all *decorated* objects and 25.35% of all bronze objects.

There is still a thin majority of children in both, in subgroup 3.1 with four out of eight burials and in group 3.2 where three of ten burials are children, with all other age categories besides old adults occurring at least twice in the latter group. Oberndorf group 3.2 is also the most balanced group in terms of *object category 1*: it has the highest percentage of both, all local vessel and vessel implements and all tools with, 37.14% and 33.33%. This group also has by a wide margin the second highest number

[22] The terminology of the sub-groups for the local cluster groups has been preserved in this chapter for consistency.

of adornment and clothing accessories with 31.58% only behind group 5, and at least 13.79% of all weapons related objects, however, only thanks to grave 21. The most notable difference between Oberndorf group 3.2 and the cumulative subgroup 3.2 is the significantly higher number of 26 vessel and vessel implements with 8 potential additional lost vessels and vessel fragments from the *category 2* others. Of these, there are 7 drinking related vessels, 5 for eating or cooking, 13 for storage and transport, and the single urn from grave 44. The four child burials only have two storage and transport vessels, but five fibulae and three beads.

9.3.2.2 Ossarn

Even more than in Oberndorf, the conclusive individual clustering in Ossarn is practically identical to the cumulative cluster groups. The only differences to the cumulative clustering specification were the same decrease in the range of grave similarity weight α to 0.6 to 2, as done in Oberndorf, and a reduction to only four clustering groups appropriate for the low number of 27 burials. The cumulative cluster groups remained the same, only grave 14 changed from subgroup 3.1 to group 4. The silhouette score' for the final clustering in Ossarn was 0.15 while the 'Dunn coefficient' was 0.75.

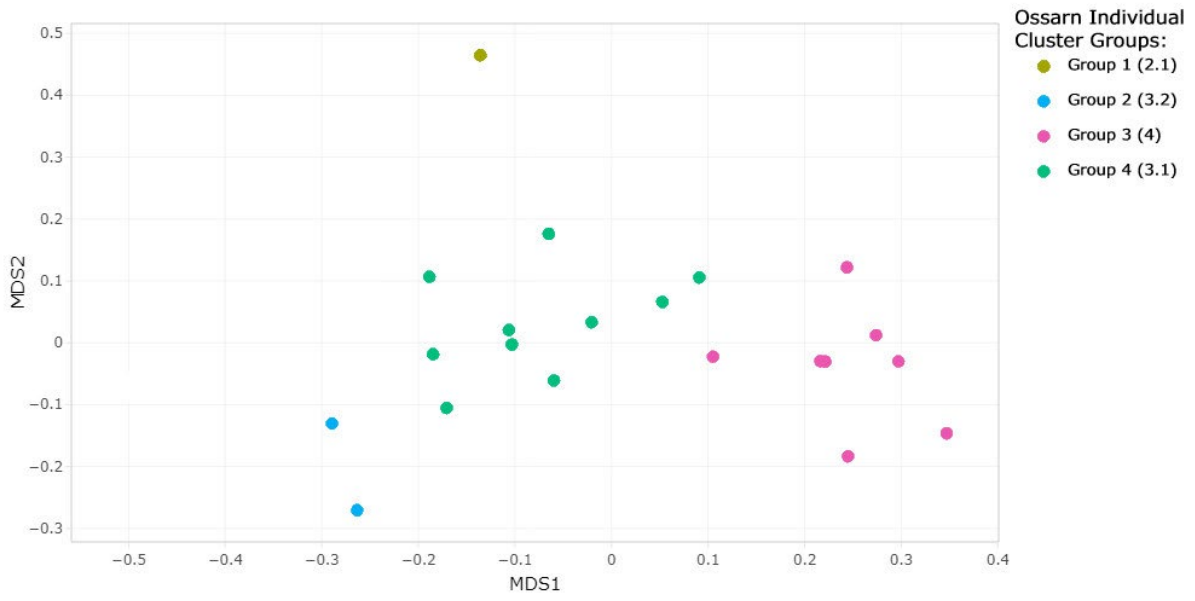
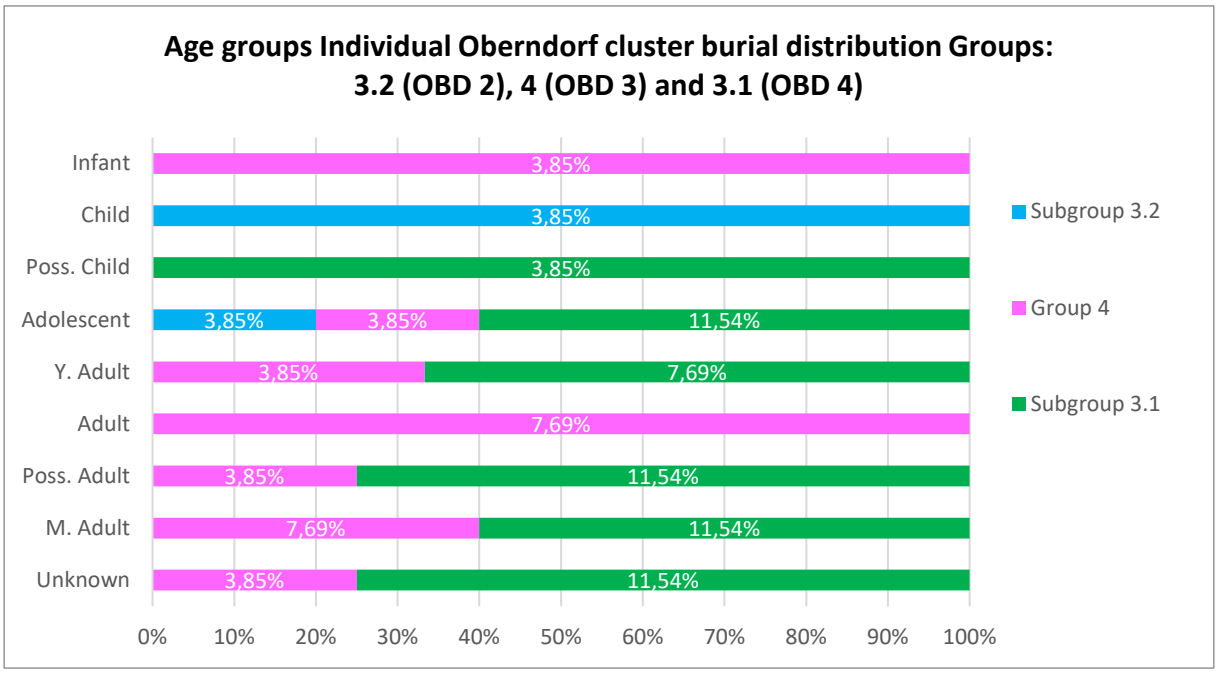


Fig. 18: Scatterplot obtained after the individual Ossarn clustering process with 4 groups.

The four Ossarn clusters are as follows: Group 1, which is the only *surrounding* structure grave 25 and thus identical with subgroup 2.1, group 2 which is matching with subgroup 3.2 and consist of graves 1 and 17, group 3 which is equal to the cumulative group 4, with the exception of the previously mentioned addition from grave 14, and finally Ossarn's group 4, which is identical to subgroup 3.1, with the exception of the loss of grave 14. This middle adult male individual's switch is based on the fact that he has only 5 *undecorated objects*. As described when the cumulative group 4 was presented,

the *multiple* burial graves 15, 18, and the young adult female buried inside a wooden coffin in grave 23 have all been destroyed. Their inclusion in this group should therefore be taken with caution.



Most of the statistical trends presented above repeat themselves in Ossarn. One exception is that the Ossarn groups 2 and 4 have fewer children than the cumulative supra-group 3. Together, both groups consist of only one definitive child and one possible child; three individuals are respectively undetermined or possible adults; two are definitely either middle or young adults; and the majority of four are adolescents. Showing that, despite a lower number of children, the Ossarn variation of the cumulative supra-group 3 still consists of 37.5% of individuals that were probably under the age of 20 and 50% that were probably under 35 years of age at the time of their demise. These numbers, however, are distorted because of the generally undesirable conditions in which many burials were found. This is illustrated not only by those three destroyed graves but also by the fact that for a significant number of 11 burials, no anatomical *sex* could be determined. Of those, only two are 'cremations' from grave 6. For one of these, along with one burial from grave 4, as well as graves 22 and 28 neither *sex* nor *age* could be determined. In contrast, there are 12 graves without any sign of looting; only graves 2 and 13 show signs of being probably looted; for eight graves, no statement could be made, including the three destroyed graves, however, no grave is definitely looted.

9.3.2.3 Inzersdorf

Lastly, the final Inzersdorf cluster are similar but not direct matches to the cumulative one. Due to the very low number of 12 graves and 13 burials, clustering these made a reduction to three groups necessary. Since all graves are within a *surrounding* structure and all but the *double* 'cremation' in grave 282 were 'inhumations', it was attempted to give a higher emphasis on object based similarity.

However, when weight changes for α, ranging from 0.5 to 3.5 and variations in between were tested, no notable changes occurred. Those groups presented here were finally calculated with the same α value as in Oberndorf and Ossarn. Apart from this, no specifications were changed. The 'silhouette score' for these three cluster groups is 0.13, while the 'Dunn index' is 0.74.

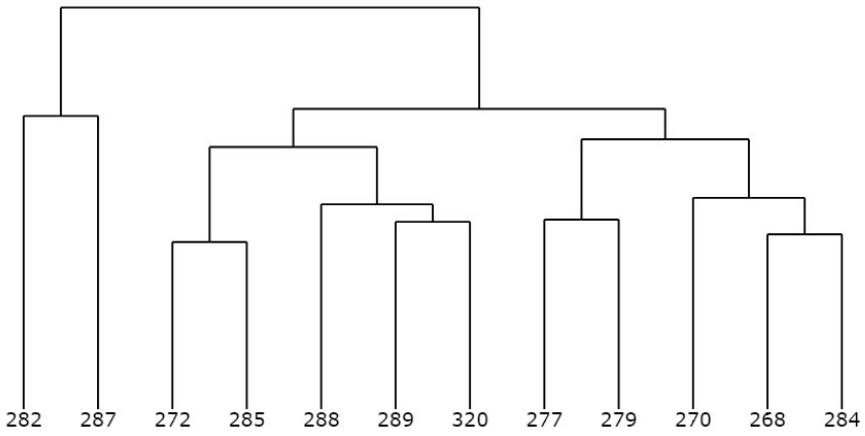


Fig. 19: The final Inzersdorf dendrogram.

Aside from the *double* 'cremation' 282 of the cumulative group 6, all local graves were part of the cumulative supra-group 2, which is essentially all 'inhumation' burials within a *surrounding* structure. As with the majority of burials in cumulative subgroup 2.2, the graves that were definitely looted contemporarily, still have the highest *number of objects* and *decorated* objects. This factor, however, was not part of the clustering process. It simply naturally occurred as an additional analytical differentiation within the cumulative division between subgroups 2.1 and 2.2, due to the significantly higher number of variables that could be compared. Working with only the Inzersdorf graves, these 11 graves all had the same 'ritual type', and a somewhat similar *object* and *decorated* objects count, as well as a low number of bronze objects. Even the objects from *category 1* were distributed fairly evenly, with the exception of weapons. Consequently, the algorithm determined the presence of any weapon or weapons related object as the primary dissimilarity. For this reason, both supra-group 2 subgroups are not well reflected in the individual clustering process. The 'inhumation' infant burial in grave 287 was grouped together with the *double* 'cremation' in grave 282 based on its low *number* of only three *objects* and, besides one small pot, the lack of any object *category* but adornment or clothing accessories.

When comparing both the individual and cumulative clustering results, the latter seems more representative of any kind of group identity, as the graves were compared and contextualised with regionally and chronologically related burials. The individual clustering, however, shows the limitations

of this method when applied to a low number of data points and variables, as it presents far less detailed and thus less accurate groupings.

10 Interpretation of the Statistically Derived Groups

The clusters discussed in this section will be based on the eight cumulative cluster groups and subgroups as presented in 11.3.1. In general terms, the derived clusters are very different in the way they convey group identities. Particularly, the two supra-groups and their subgroups are a complex fusion of intersecting group identities. The quantitative results clearly indicate the exhibition of relative material wealth or 'economic capital', as a recurring theme for clustering. This, however, is not the only or necessarily the most important inter-group commonality in any of the groups in question. One must also consider that any display of wealth is not necessarily a clear representation of social hierarchies. And if so, then the portrayed 'economic capital' represents only one aspect of the represented social role.

On the other end of the spectrum are groups that are clustered due to their comparatively uniqueness or dissimilarity, an intentional or unintended lack of attribute data, or a combination of the two. This is particularly evident in the two cremation clusters. Although specifically those six cremations of group 1 are comprised of various intersecting group identities, their primary communality is their burial rite. This leads to a potential methodological issue that one must be aware of. Using cremations as data for clustering procedures naturally results in a comparatively low resolution attribute space in many cases. From a quantitative point of view, this renders cremations an unfavourable, sometimes even undesirable dataset for clustering procedures. Nonetheless, from a theoretical point of view, this lack of information could have been an intentional expression of religious identity. Most likely, the community of the deceased was aware of the destructive nature of their chosen ritual, as well as the obvious differences to inhumations. Again, this assumption must be approached with caution because religious identities remain mostly unfathomable and intersect with other group identities just as much as they can transcend social inequality and power dynamics.

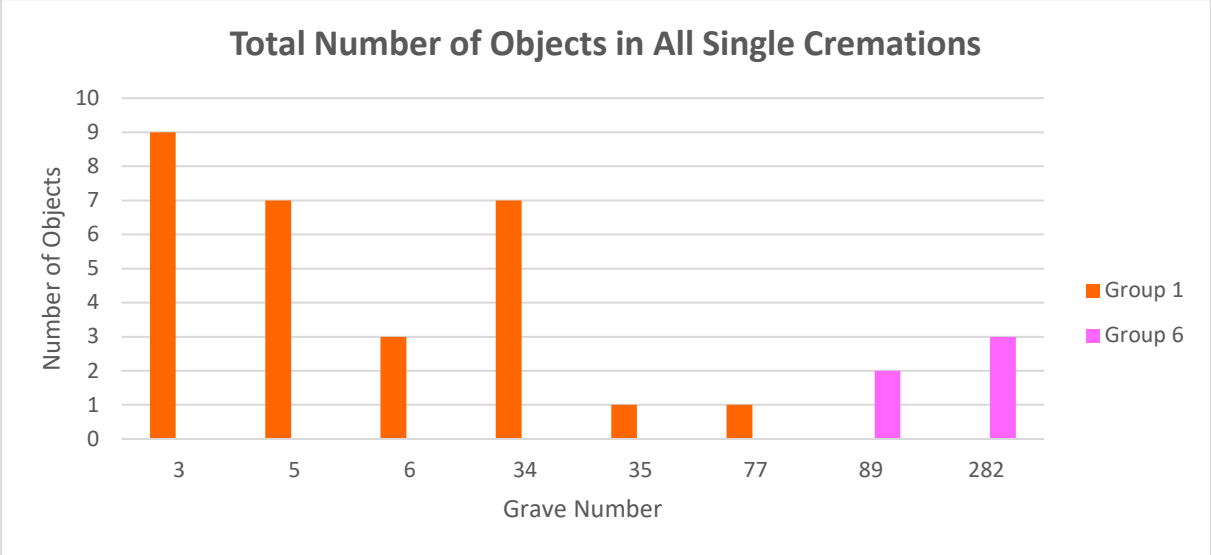
For these reasons, and since, among other dynamics, identity formats on the interaction of similarities and dissimilarities, this discussion will focus predominantly on inter-group comparisons and additional contextual analogies presented in previous chapters. The argument can be made that providing an interpretation of each group only based on its individual characteristics would be methodologically flawed. That being said, while this is true for the larger complex supra-groups, the smaller groups 1, 4, 5 and 6 will incorporate a discussion on some of their more unique burials and their individual identities. Those in particular must be taken with caution but will be crucial when they are put into spatial context in the consequent spatial analysis of the cemetery sites. As stated several times before,

it is only through the comparison and integration of various groups into the larger framework that a true comprehension of any society can be reached (Popa, 2018, 123-124).

10.1.1 Group 1 – The Inconsistent Flat Cremation Group

This group consists entirely of all six flat cremations in Oberndorf. These six burials were clustered predominantly for their common ritual and compared to the other cremation group 6, a more similar number of objects and lack of any bronze objects. As stated in the results, this group not only distinguishes itself to all remaining groups but also with itself. Even their common denominator, their burial ritual, presents itself in three distinctive ways their cremated remains are deposited. The remains of both Graves 77 and 34 are deposited within a ceramic urn, whereas the remaining four individuals of this group were deposited unseparated. The latter practice is further differentiated depending on the way the ash is spread inside the graves. First, graves 5, 6 and 35 whereas the cremation is scattered over the entire bottom layer of the graves pit. Second, grave 3 whereas the ash is only deposited at a certain, sharply outlined area of the grave that may be an indicator for an organic urn (Ramsl, 2020d, 414). We do not know if these differences are based on further religious distinctions, additional intersecting group identities or merely practical reasonings. All these practices are also evident at the neighbouring cemetery of Pottenbrunn (cf. Ramsl, 2002, 16).

The most obvious differentiation within group 1 is their number of burial goods. Graves 6, 35 and 77 follow the general trend of most cremations within the overall data set (cf. diagram), as they have a maximum of three to no burial goods. In contrast to this, are the three 'outlier' graves. Grave 34 has a total number of seven objects and follows the trend of supra-group 3 in their composition of drinking, storage and eating vessels, with the obligatory knife. As presented in the results, this contrast of object numbers and composition is particularly true for grave 3 and, albeit less so, for grave 5 since both graves are unique in contrast to the whole dataset.



For grave 5 this uniqueness is expressed by an overemphasis on iron objects. Of its seven burial goods, all but the individual's potential urn are iron objects. Two are adornments, one small inconclusive ring, two knifes, one possibly being a folding knife and the only awl, or at least awl like object. This composition is unique for the awl and folding knife that are the only ones of their kind within the whole dataset. For the lack of more details, a comprehensive interpretation of this individual's projected identity is naturally problematic. At this stage we only have two indications in this regard, one being that this individual was one of four anatomically determined cremated adults and its overemphasis on metal objects, particularly tools. This could suggest a smith or a similarly expressed occupational identity with an intersecting deviating afterlife believe.

Grave 3's weapon heavy burial good composition and unique cremation relates to an already discussed phenomenon of an unique group of cremated weapon carriers described in the past (Ramsl, 2020d, 415-416). This group emerges especially during LT B1 and differentiates itself from the standardised burial rites of weapon bearers, which itself can be observed in several burials in Oberndorf. The main distinguishing characteristics are that they are cremated, and that their swords are often intentionally bent, making them unusable. This at least suggests a variation in afterlife beliefs. Additionally do the sword scabbards depict a distinctive novel picture language that portrayed mythical creatures as dragons or griffins. These burials are often associated with the advent of higher mobility, migrations phenomena and 'Celtic' mercenaries (Ginoux, 2012; Ramsl, 2020d, 415-416). Although such correlations, or even more specifically, a partially religiously motivated mercenary group sharing a strong *'Esprit de Corps'*, as suggested for the historically documented *Gaesatae* (Dobesch, 1996, 19) is tempting, by and large, it remains unclear why these individuals were buried in such a unique way. Grave 3 also is not a straightforward textbook example of this specific phenomenon, as it lacks a sword or decorated scabbard, but instead has a richly decorated box belt plaque and, intriguingly a most likely intentionally bent knife.

10.1.2 Supra Group 2 – A Stratified and Diverse Elite Buried within Surrounding Structures

This supra-group consists entirely of all inhumations that were elaborately buried within a surrounding structure. The term 'surroundings' is a loose and neutral translation that describes ditches that in most cases surround one grave or, at times, even several graves, as with graves 284 and 285 in Inzersdorf (Neugebauer, 1996b, 115, table 2). The critically discussed correlation between the cost and energy to build intrinsic crypt like structures as the surroundings, and social rank is clearly debatable, but does seem plausible in this case. Not only are the effort and portrayed importance of the ritual signs for the social relevance of those buried individuals, but particularly for subgroup 2.2, there is also the elevated

emphasis on prestige weapons in relation to all other groups, the high number of objects, decorated objects, and bronze objects, despite being the group with the highest number of looted graves in relation to the number of graves (cf.: diagram 1?). Based on the established social theory for this time period and spatial context, an elite group in a seemingly agriculturally focused landscape most plausibly suggests a leading core family of an extended family group (Fernández-Götz, 2014, 48-49, 50, fig. 3.5; Rebay-Salisbury, 2016a, 50-51; Ramsl, 2020a, 19). How such power dynamics functioned in reality is extremely individual, thus relative and can never be answered precisely. Regrettably, the scientific answer for this assumption in form of anthropological kinship analysis remains among the most important missing factors of this study.

10.1.2.1 Subgroup 2.1 – An Elaborately Buried Destitute Elite

This subgroup is characterised by two main features. To begin with, although buried within an elaborately constructed surrounding structure, all these graves captivate for their lack of displayed wealth. This representation of this supra-group's argued elite status is particularly prevalent when compared with subgroup 2.2 and even supra-group 3. As depicted in the results, this subgroup has a significantly smaller number of objects in any regard than subgroup 2.2. Furthermore, despite accounting for 13.79% of all examined burials, it ranks only fifth among all groups in terms of category 1 adornment or clothing accessories with 8.84%, sixth in terms of tools with 6.67%, and third with regard to vessels with 16.90%. These vessels are predominantly eating or cooking vessels, particularly bowls type BW 2a, and a variety of pots, for storage and transportation. Only three graves have been definitely looted, and another is probably looted as well. This is contrasted by considerably higher numbers in both regards for subgroups 3 and 4. Only in terms of weapons, subgroup 2.1 ranks second with 29.17%, still behind subgroup 2.2.

There is, however, a distinction in weapon types between both subgroups. The majority of weapons in this group are undecorated polearms. Only grave 4 from Oberndorf, which was badly disturbed by an excavator, has a sword scabbard as a burial object. As this grave was also often clustered in the fuzzy area of both subgroups, grave 4's affiliations in this subgroup should be viewed with caution. The other feature of this group is that it is made up almost entirely of middle- and young adult men, with one male individual whose age was indeterminable. This group's only female is buried in Inzersdorf grave 272. The remaining individuals are the connected burials of an infant and an old adult male from the quadruple surrounding structure system from Inzersdorf and the sex-wise undetermined possible adult individual buried within the double circular structure in Ossarn.

If we leave those burials aside that lack anthropological analytical data such as the Ossarn burial, it is difficult to refute that the majority of individuals of this group are predominantly composed of males of fighting age. Five of these male individuals are furthermore buried with polearms. This is not

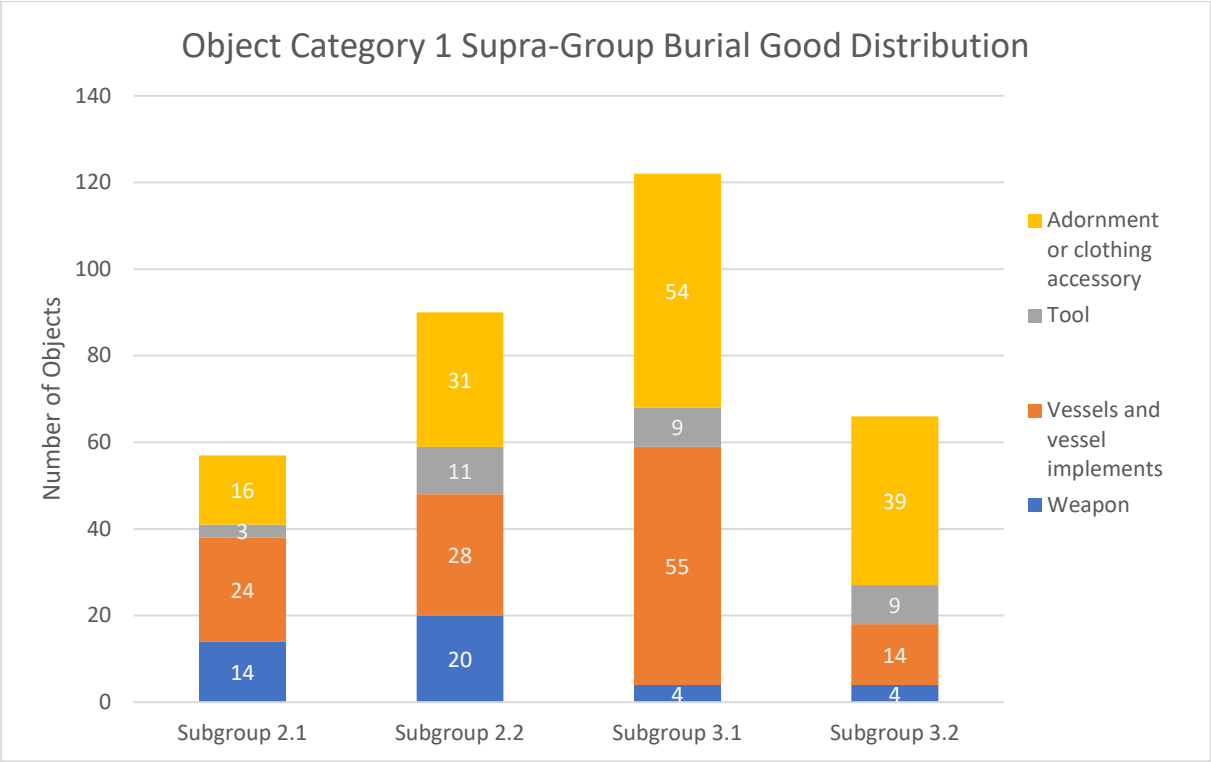
contradicted by the female individual, or the connected old adult and infant burials as all these are likely variations of the same social identity but with differing, intersecting gender and age identities. It is unclear why these factors are combined with a comparatively small number of signs of material wealth despite being buried within a complex structure, particularly with regard to subgroup 2.2. Interestingly, again with the above-mentioned outlier, including the disturbed male burial 4, and one other middle adult male in grave 25 (OBD/04), all individuals are buried inside a surrounding structure system. Specifically, within the dominant quadruple system in Inzersdorf.

One argument that will be discussed in more detail in the consequent spatial analysis and final discussion is that the majority of burials in this subgroup could represent the 'less relevant' branches of the core family. In other words, the unfortunate second or third sons or daughters, cousins, or nephews of fighting age. For their family ties they are still buried within the 'family crypt' despite owning less material wealth or any other significant sign of accomplishment compared to many of the 'common people' or retinue buried outside the surrounding structures. It is undoubtedly possible that the community buried these individuals deliberately without much focus on their 'economic capital' as their achievements lay outside of this sphere. This would however stand in stark contrast with otherwise deliberately portrayed material wealth in almost all remaining analysed groups that even manifests in several varying ways.

10.1.2.2 Subgroup 2.2 – The Gender Neutral, Armed Core Elite

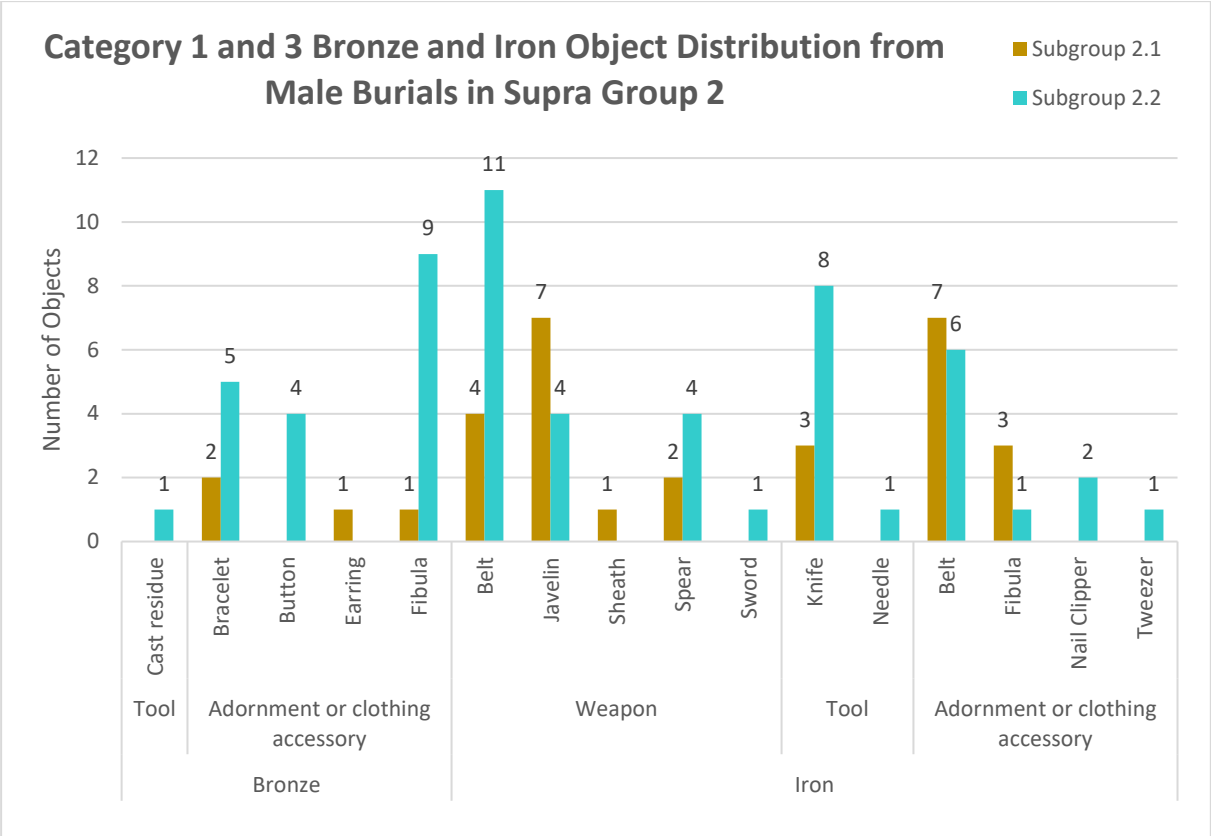
Subgroup 2.2, on the other hand, represents a more typical, average local elite burial for its time (Grömer and Ramsl, 2019, 328-329). At least average in comparison to significantly wealthier equipped but undisturbed graves of group 5 and subgroup 3.2, but clearly distinct from the remaining burials in the data set. Of course, this assessment must consider that all but one of this group's graves have been plundered. Aside from the above stated groups, almost all of subgroup 2.2's ten burials are among those with the most objects, decorated objects, and objects made of bronze, despite being almost entirely looted contemporaneously. These figures do not only mainly refer to adornment or clothing accessories but to all categories, including otherwise underrepresented weapon-related objects.

Many supposed material and ritual elite expressions of this subgroup are, in many ways, exaggerated reflections of the general burial rite practices, i.a., observable in the largest supra-group 3. This is particularly evident in object category distribution trends. Almost all common object categories, be they fibulae, drinking vessels, belts, or weapons, are present in a statistically noteworthy manner. On the contrary, in most other groups, at least one or two essential object categories are either overrepresented or underrepresented (cf. diagram). The weapons, as described above, are also far more prestigious since seven out of ten decorated weapon-related objects are part of this group.



The elite characterization is also visible within the ritual since all but grave 31 at Oberndorf contained animal bone offerings. Albeit we only have this data for Inzersdorf, of those four subgroup 2.2 graves, two had a combination of *caprinae* bones: grave 279 along with domestic pigs, or both in grave 277 together with additional cattle bones. Both graves, 289 and 320, had been given *caprinae* bones. In comparison, only graves 298 and 288 in Inzersdorf subgroup 2.1 were buried with cattle bones each, and grave 272 with only pig remains (Neugebauer, 1996b, 128). It should be noted that these offerings are not as outlandish as chicken, red deer, or goose that are found in other contemporary elite burials (Ramsl, 2020d, 418). That being said, in Pottenbrunn, domestic pigs make up over 70% of all animal bones, while cattle, *caprinae* and chicken remains each only account for between 30 and 20% (Ramsl, 2002, 336).

The primary issue for any interpretation of this subgroup is its almost entirely disturbed and looted condition. Hence, why any comparison or analogy needs to be (1) related to the group and individual identities portrayed in this cluster group, (2) must be buried within a surrounding structure, and, importantly, (3) must be undisturbed. One such example for an analogous, undisturbed male burial would be the elaborately furnished male burial in grave 562 from Pottenbrunn (Ramsl, 2002, 46-48). This middle adult male burial has been buried within a circular surrounding structure and dates to LT B2. His burial goods consist of more than 20 objects, including, i.a., a sword, a spearhead, a shield rim, two fibulae, an arm ring, a scissor, and a knife, all made of iron. What is particularly noteworthy is the focus on iron objects, even for adornments such as fibulae. This aspect is something that this individual shares with most male individuals of either subgroups 2.1 or 2.2 (cf. Diagramm).



For this subgroup's female burials, such comparisons are even harder to find. One reason for this is the elite group's supposed unconventional female gender roles. This is most evident in the previously described (cf. 9.5.1) female weapon graves 102 and 37 in Oberndorf [23]. Aside from being rare examples of female weapon burials (cf. Ramsl, 2020a, 167-168, fig. 23), these burials possess even further similarities. Both are buried within a standalone circular surrounding, both date to LT A, both are middle adults, and each grave was excessively looted and disturbed while still containing the second and third most objects in this subgroup. The most evident parallels for these burials are three other graves of women buried with weapons from regionally connected sites: grave 117 from Mannersdorf (Ramsl, 2011, 75, fn. 9; tables 135-141), as well as from the Slovakian sites of Chotín, grave 30 (Ratimorská, 1981, table 19: A) [24] and Kamenín grave 3 (Benadik, Vlček and Ambros, 1957, 100-101). As the intersection of gender and class identities will be one main aspect of the final discussion (cf. 14.3), an in depth debate on the implication based on these analogies, and other group identity intersection will follow at that point.

[23] As already presented in 9.5.1, burial 31 is excessively disturbed and does not contain any weapons but shows clear signs of a weapon belt in the form of a '*Koppelring*', which in most other contexts is related to swords or other weapons carried on the hip.

[24] It is important to note that in both cases, Mannersdorf (Ramsl, 2011, 75, fn. 6) and Chotín (Tóth, 2015, 119, table 1), each burial's sex was anthropologically determined, not confirmed by a DNA analysis, and therefore remains in contention. For Chotín's grave 30 such a DNA analysis was attempted but remained inconclusive (Gretzinger and Schiffels, 2020, 215, table 1) .

The still heavily disturbed female burial in Grave 320 from Inzersdorf, presents potentially a more normative female elite burial. To find an undisturbed comparison, even for a more straightforward female elite burial is still surprisingly challenging. All female graves in Pottenbrunn buried within a surrounding structure are similarly extensively looted (Ramsl, 2002, 22). Mannersdorf and its relatively low disturbance rate of 13.5% (Ramsl, 2011, 30), brings other difficulties in the form of regional peculiarities. Aside of for the Leithagebirge typical stone structures within graves (Nebehay, 1973, tables 20, 21; Ramsl, 2011, 28; Ramsl, 2020d, 410), it is particularly the high number of female burials with two to four anklets that are connected to similar sites in Switzerland (Ramsl, 2011, 246). In Austria this costume phenomenon is somewhat unique in such a high quantity, and aside of Mannersdorf only occurs isolated, as with Oberndorf's grave 121 (cf. 9.5.1) or grave 9 from Au am Leithagebirge (Nebehay, 1973). Since this connection could render these individuals as mobile agents, and for the lack of anklets in grave 320's undisturbed foot region, any direct comparison must be taken with caution.

With that being said, Mannersdorf's grave 13 (Ramsl, 2011, 41-43 and tables 48-54) still serves as a representative of an undisturbed elite female burial. This young adult, dates to LT B1 and was buried in a rectangular surrounding structure. Its burial good compositions consist of four bronze anklets, five bronze fibulae, three being '*Fibeln mit kugelförmiger Fußzier'* (Fibula with spherical foot decoration; in short, FKF), one type '*Münsingen*', and another sculpturally decorated fibula with elaborate mask depictions, a glass and amber pearl necklace, a convolute of bronze wire rings, along with a miniature wheel, a bronze Situla, gold fingerings, and silver bracelets, only to mention the most striking ones. Showcasing the potential additions to this group's already substantial number of valuable objects if the analysed graves would not have been looted.

10.1.3 Supra Group 3 – A Youthful Stratified 'Middle Class'

As presented in the results, the titular youthfulness of the largest group in this study is its most prominent commonality. More than half of this supra-group's members died when they were around 35 years old, and 40% died when they were around 20 years old. Particularly, the high number of six children, along with one additional possible child, is conspicuous, as no other group contains more than two children. The reason why the age distribution of this group is so predominantly young must remain speculative. Nevertheless, the already stated (cf. 6.1.3.1) correlation between higher numbers of infant or child mortality, smaller numbers of individuals that reach adulthood, and, consequently, a greater proportion of young individuals seems plausible (Chamberlain, 1997, 249).

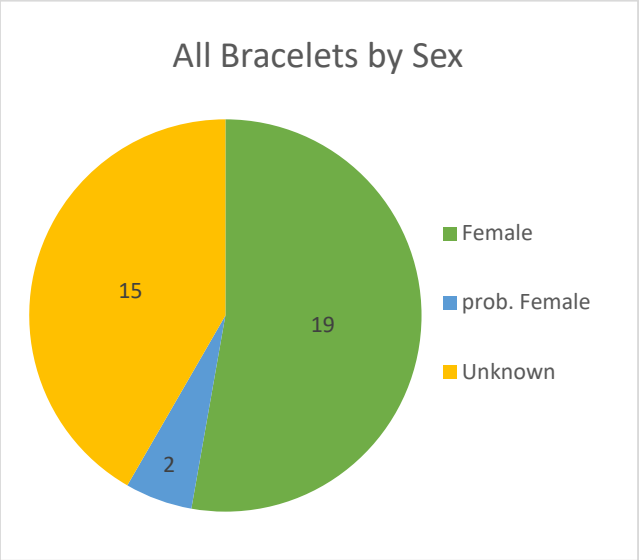
Aside from this, supra-group 3 presents itself as both consistent and, in certain aspects, with additional outliers. This is most noticeable in burial rituals. Notwithstanding that all graves are flat graves, and the apparent majority are inhumations, four graves contain multiple burials; two of these are rare

combinations of inhumations and cremations. Although the sexes are distributed evenly, these numbers should be taken with caution, as the young age of many individuals makes any anthropological sex determination difficult. Hence, for 15 of the 29 buried individuals, no sex could be determined. More so than with supra-group 2, the division of this supra-group is mostly based on material aspects. With ten exceptions and five graves for which no statement could be made, both subgroups are largely unrobbed or unopened, at least in comparison to subgroup 2.2.

10.1.3.1 Subgroup 3.1 – The Youth as the Social Basis

While the age distribution is visible in both subgroups, the argued youthful nature should be primarily associated with the far larger group. Objects-wise, this group represents an average, considering its position as the largest group with a relatively low number of grave robberies. Almost all object categories are evenly present, aside for the almost complete lack of weapons outside of graves 13/OBD/82 and 13/OSS/84 (cf. diagram). In regard to the percentage distribution of the object categories within each group, subgroup 3.1 has average to high numbers in all categories. The exceptions, aside from the aforementioned lack of weapons, are drinking vessels and bracelets. Drinking vessels cumulatively made up 13.29% of all objects in this subgroup, whereas 8.23% of all objects are bracelets, ten of which are bronze and three of which are iron. In comparison, no other group has an internal drinking vessel distribution above 7.1%. Similarly, albeit less conspicuous and not counting the six burials in group 5, no group has an internal bracelet distribution above 6.8%.

These bracelets are one of those occasions, whereas traditional identity markers are applicable since the majority of the nine bronze bracelets are from female burials (cf. diagram , also: Grömer and Ramsl, 2019, 333). All the remaining bracelets, including their iron variants, stem from graves whose sex was undeterminable. However, bracelets are not the only obvious gender- or sex-related features. Nine out of twenty fibulae are part of female, or probably female, burials, with four of these being adolescent. Only four fibulae were found in male, or probably male, burials: one adolescent, one young adult, and two for which no specific age could be determined. The remaining fibulae all stem from seven sex wise underminable burials, more precisely three children and four adolescents. The only other object category that shows significant distribution differences are bowls and porringers, of which half are from male burials. All other vessel categories, including the aforementioned drinking vessels, show no clear distribution differences.



This group could be argued to represent the youth and, as a result, the social foundation of their respective communities. This is striking as their age was not a factor in the algorithms' clustering. Thus, their material wealth, burial goods composition, and burial rites arguably correlate directly with their age identity. Furthermore, in contrast to subgroup 2.2, gender roles are presented in a more traditional way. This leads to the conclusion that gender and age roles intersect directly with class identities.

10.1.3.2 Subgroup 3.2 – A Wealthy 'Middle Class'

In many ways, subgroup 3.2 is a more prosperous branch of subgroup 3.1. It consists of only seven individuals, covering both sexes and almost all age categories. The most significant distinction is the abundance of decorated objects, particularly adornments and clothing accessories. As a result, this group can be regarded as a wealthier variant of what might be considered the middle class or common people. It should also be noted that such classifications are not intended as traditional class distinctions but rather as a depiction of the statically obvious and likely intended separation between the two supra-groups.

This group, like its younger counterpart, reflects the more traditional gender roles of its time period. The burial of the middle adult female in grave 29 is one of only four instances in this data set in which a female individual is buried with spindle whorls. Aside from this grave, these markers for traditionally perceived gender work distribution are found only in the female adolescent double burial of grave 18 and the child burial 13 that is also part of this subgroup 3.2. Curiously, both graves 29 and 18 have the highest number of objects, particularly in the category of adornments, in the entire dataset. This aspect also illustrates a recurring pattern in contemporary female burials. Grave 21 conforms to an additional gender stereotype. This young adult male is one of only three weapon burials, as well as the only one of these with clear evidence of a sword, outside of supra-group 2. The only cast residue within the data set can account for another layer of this individual's identity, permitting a correlation with a blacksmith or a similar occupational identity.

This group, along with groups 6 and 1, will benefit the most from the spatial analysis as it will lead to more conclusions about this subgroup's role in the social structure of their respective communities.

10.1.4 Group 4 – Lower Classes and Retrospectively Overly Destructed Graves

As depicted in the results, this group is a receptacle for essentially all graves, with a conspicuously low number of at most four artifacts. As has also been stated, this clustering is at least partially artificial due to the fact that three burials from Ossarn have been damaged or disturbed to the point where the apparent quantity of artefacts cannot be considered indicative of this group. It is quite probable that if they remained mostly undisturbed, these three tombs would have belonged to subgroup 3.1.

Contrarily, the remaining nine flat inhumation burials serve as a representation of this group, given that they are the graves in the entire data set with the fewest artefacts overall. These numbers stand despite only two of these graves having probably been looted. Five of these burials are of infants, and two more are of children. The remaining individuals are three male individuals, specifically one young adult, one adult, and one middle adult, as well as a possible adult female burial. All these nine remaining burials only have 19 overall objects, and only six of these had any decoration.

Disregarding the destroyed graves, the most straightforward interpretation for this group would be a mixture of members of something akin to an underclass or even possible slaves. As for the youngest members of this group, these burials could point to possible victims of the high mortality rate of that underclass.

10.1.5 Group 5 - Two Wealthy and Four Ritual Outliers

The two graves upon which this group is built, and its six burials have already been thoroughly discussed within the statistical results (cf. 11.3.1.5) and the Oberndorf data description (cf. 9.5.1). The question that remains is why these two graves are as unique as they seem.

The quadruple burials in grave 28 are primarily unique for their strange ritual composition. While no exact parallel could be found within the larger spatial and temporal context, two very similar post-depositional phenomena occur at the Dürrnberg Eislfeld necropolis (Wendling, 2020, 164). Particularly for grave 126, this was done when a subsequent burial chamber was constructed on top. In either case, the skull of one individual was removed, while the remaining body and burial goods remained *in situ* (Pauli, 1975, 113; Zeller, 1980, 175-176). It seems plausible that these parallels allow a connection between these four individuals and Dürrnberg, or more generally, the west. Although a correlation to 'Celtic' skull cults documented in archaeological context as well as in both ancient Greek and Roman sources is similarly not improbable, it must remain mostly hypothetical (cf. for a general overview: Härtl, 2005; also: Hofeneder, 2005, for passages from Appian: 86-87, from Polybios: 87-88, Posidonius: 115-118 and 130-132).

Nevertheless, there is one passage from Posidonius (Posidonius, 2004, 124; Hofeneder, 2005, 115-116; Athenaeus, 2011, 248), that allows for a more subtle analogy, than the simple correlation of the position of the skulls and the ‘Celtic’ skull cult. This testimony describes the voluntary sacrificial decapitation of a man, mostly interpreted as a high-ranking retinue member (Moreau, 1961, 57; Karl, 1989, 274; Hofeneder, 2005, 117), as part of a gift exchange that also involved gold, silver, and wine amphoras. Contrary to other passages (cf. Caesar's de Bello Gallico: 6, 16; 2014, 266) or archaeological contexts (cf., i.a. Manching: Rieckhoff, Biel and Abels, 2001, 246 and 421, table 27; Sievers, 2003, 110, fig. 113; Härtl, 2005, 46-47), this passage shares no direct correlation with war or combat related violence, but rather with a voluntary and public ritual. While this passage is generally considered to be

a faithful depiction of real observations (Bayet, 1930, 98; Hofeneder, 2005, 116), this intentional form of self-sacrifice is still unique and only survived as a shortened quotation in Athenaeus of Naucratis 'dinner-table philosophers' (cf. Athenaeus, 2011, 248). However, as Hofeneder (2005, 118) also points out, the passage specifically highlights La Tène conceptions of allegiance and specific afterlife beliefs.

In light of this, and graves 28 general group, and spatial interpretation (cf. 13), being part of a core family retinue, Posidonius' text passage would at least serve as a more plausible, albeit still hypothetical contextualization of the seemingly odd ritual depicted in grave 28 (cf. fig. 20). Lastly, since this ritual practice and reopening are exceptional in the Traisen Valley, it can be argued that the remaining community did not only correlate these four individuals with an uncommon religious identity, or at least practice, but also respected and applied this unique burial rite.

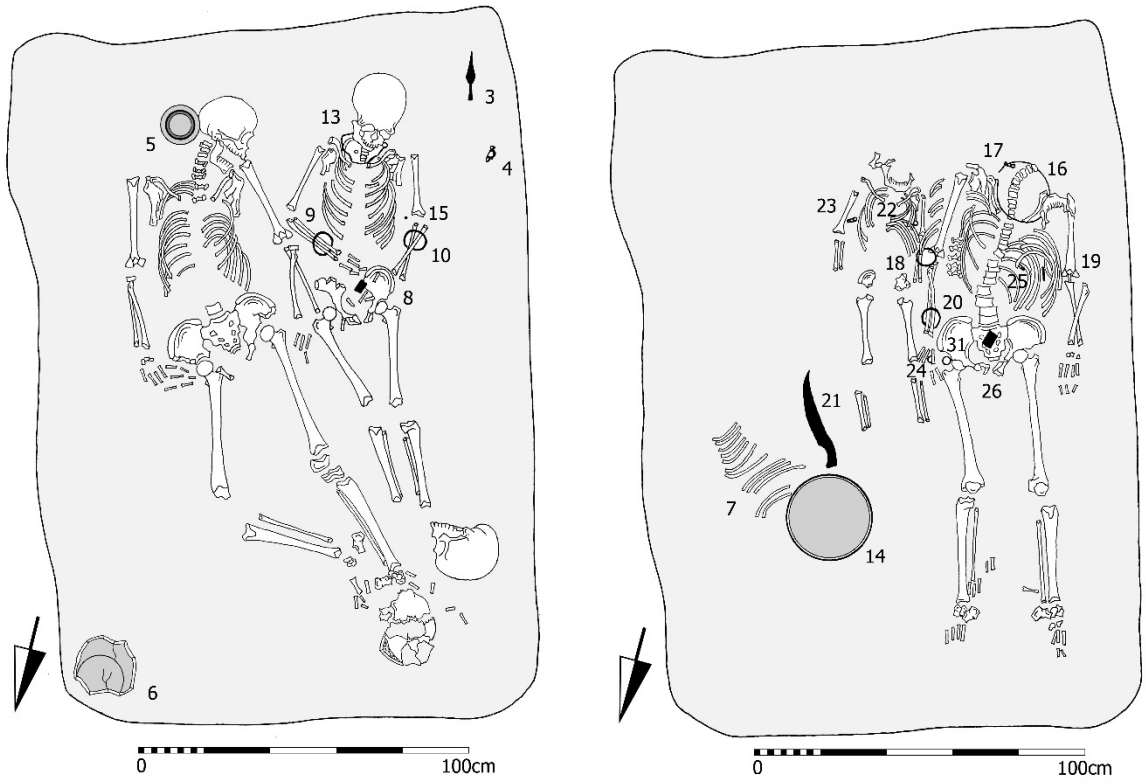


Fig. 20: Grave 28 from Oberndorf 2004. 1: The upper level with Burial ID.16 on the right. 2. The lower level (orginal graphic by M. Vignoli)

An additional common denominator among these four burials is their age, as the young, upper adult is the oldest of the four, with the other two being adolescents and one being a child. The high number of objects in this grave, naturally, must be taken with a grain of salt as it counts for all four burials. Having said that, the adolescents in particular shared a high number of decorated bronze adornments or clothing accessories. That and the very similar composition of *Marzabotto* fibulae and bracelets are the primary reasons why these graves have continuously clustered together.

These similarities also raise the possibility that these two teenagers in grave 28 are female, such as their counterparts in grave 18. This leads to an intriguing conundrum. This speculative assumption is based on the characterization of bracelets as a female identity marker. As shown in diagram (cf.), this statement is almost entirely accurate, at least within this studies data set. However, that stated conundrum concerns the upper adolescent (B. ID. 16) of grave 28. This individual is buried with an unusual combination of diverging gender identity markers in the form of a javelin and two type 3 and type 5 fragmented bronze bracelets.

The previously discussed double female adolescent grave 18 is notable for its unusually large number of decorated and bronze objects, particularly adornments and clothing accessories, and, for this dataset, unique vessels. Although both burials represent a more traditional gender characteristic of Early Iron Age rich female burials, they are still relatively unique in their composition. Neither in Mannersdorf (cf. Ramsl, 2011, 239, fig. 192, 240, fig. 193), nor in Pottenbrunn (cf. Ramsl, 2002, 131, fig. 138, 132-133, 134, fig 142), which both have a number of wealthy female burials, do we find a combination of one bracelet per arm [25], necklaces, fibulae of the types FKF or *Marzabotto*, a number of decorated spindle whorls, and rare vessel types such as the situla like bottle and the '*Linsenflasche*', as well as the lack of anklets. What intersecting identity aside of their gender and age identities can be linked with their unique burial representation will be discussed in the spatial analysis and the closing discussion.

10.1.6 Group 6 – The Cremated Elite

The final group consists of only four unseparated cremations, one of which is the double burial in Inzersdorf. They were all buried within a rectangular to square surrounding structure. Accordingly, this group is something of a hybrid between group 1 and supra-group 2. Much like group 1, these four individuals are difficult to interpret due to the natural lack of data. The two individuals buried together in Inzersdorf grave 282 are both males, one is a middle adult, the other an adolescent. While their burial goods are quantitatively modest, the bronze *Vogelkopffibel* and dress pin and the iron nail clipper share a modest prestige character. The Oberndorf cremations are themselves quite different. Grave 89 is a cremated infant that, aside from a lost vessel, only contained a bronze bracelet. The individual in grave 54 was buried without any object and in such a state that neither its age nor sex were determinable.

If the hypothesis that all individuals buried within a surrounding are part of a core family is accepted, the most plausible explanation for these cremations would be that they are members of that family

[25] Ramsl (2011, 240) shows, however, that in Mannersdorf four bracelets are only typical for young and middle adults.

who share the same afterlife believe that require cremations. This group's interpretations also benefit from the spatial analysis, which is the consequent chapter.

11 Spatial Analysis

Generally, any quantitative study of burial contexts should be accompanied by a spatial analysis. Such maps are particularly essential for regional studies, as done by Popa (2018). A map consisting of all three cemeteries to present such a regional analysis, while desirable and essential for future applications, regrettably presented itself as far too incomplete for any practical visualisation and interpretation. Adding in this instance no further information beyond what rudimentary maps already reveal (fig. 5). The importance of a spatial analysis, however, also applies to studies on single cemeteries. The issue remains that such cemeteries are rarely excavated in their entirety, rendering such an analysis similarly fragmented depending on the research state of each cemetery. This is also the case for the study of the three cemetery sites. As stated, all three cemeteries were excavated incompletely and present different issues. Inzersdorf only presents a very small elite section of a larger, not yet fully published cemetery (Morschhauser and Pollak-Schmuck, 2021). The situation is worse in Ossarn. Whereas Inzersdorf will at the very least allow for future large-scale investigation, Ossarn's cemetery site was substantially destroyed even before the 1960s excavation campaigns (Neugebauer, 1992, 41). Oberndorf, while still incomplete, remains the cemetery excavated most comprehensively and therefore will get the most attention in the spatial analysis. If not stated otherwise, this analysis is based on the cumulative clustering procedure.

11.1 The Oberndorf Cemetery

There are three spatial groups within the excavated area that can be interpreted. Oberndorf's cemetery will be artificially subdivided into southern and northern sections for clarity. Two of these spatial groups are located in the northern segment (fig. 23) and are interpreted based on their cluster interpretation and the visual pattern. This pattern reveals itself in both instances as groups of surrounding structures adjacent to a double row of flat graves in the southeast. The third, southern spatial grouping appears to be enacted around the large circular structure and will be explored in the subsequent sections (fig. 27).

One essential aspect of Oberndorf’s spatial analysis is the cemeteries' multiphase character. For the analysis of this section, the phases of the Early Roman Imperial Period and the directly preceding Late Hallstatt Period are particularly relevant. Both phases pose a problem, as circular ditches and structures that resemble the surrounding structures of the Early La Tène Period are prevalent in either period. While a number of these structures have been dated (cf. Neugebauer and Gattringer, 1982, 86, fig. 18, 87, fig. 19), others lack any burials or intersecting dated structures to allow an exact

classification. Even if an increased occurrence of features from the Roman Imperial period in the north and those from the Late Bronze Age in the south is evident, features from both phases can be found throughout the studied area (Neugebauer and Gattringer, 1982; Blesl and Gattringer, 2004; Morschhauser, 2012).

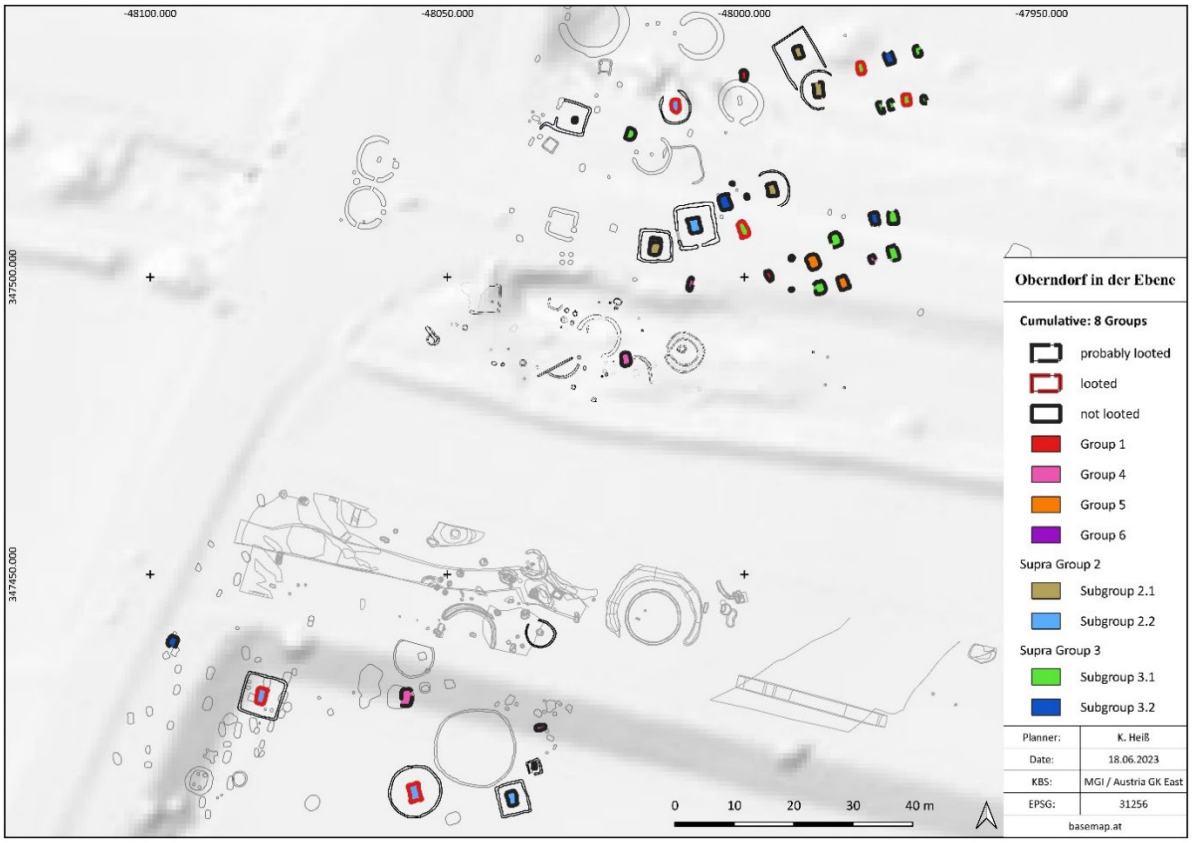


Fig. 21: Complete Map of Oberndorf's Early Iron Age cemetery with the cumulative cluster groups (map by K. Heiß).

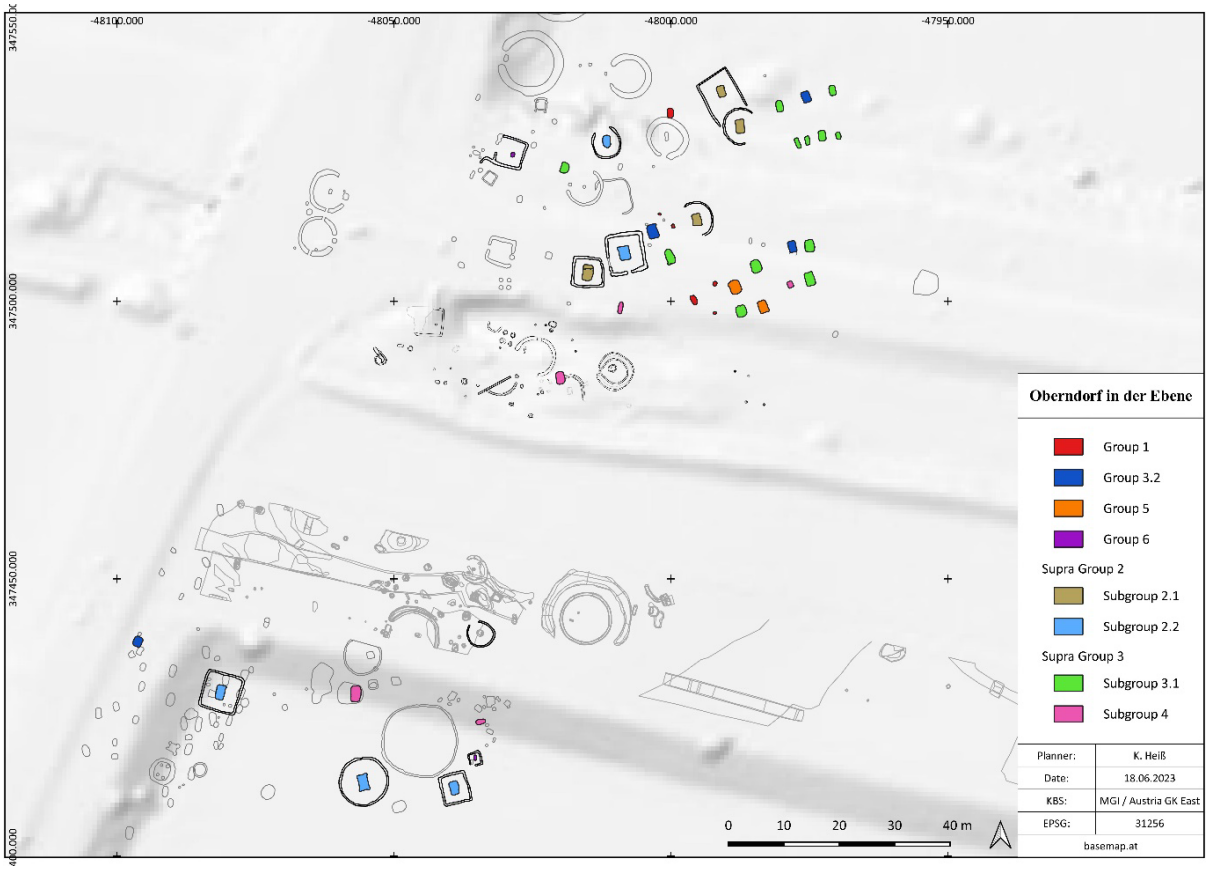


Fig. 22: The same map with the individual Oberndorf cluster groups. For an easier understanding are the cluster group colours the same as in the map above (map by K. Heiß).

11.1.1 The Northern Section's Spatial Groups

The first of the two northern spatial groups are the connected double surrounding structure with graves 27 and 25 buried within it, as well as its adjacent double row of flat inhumations. Both individuals within the surroundings are male and are part of subgroup 2.1. Grave 25's middle adult is buried within an open circular surrounding structure. His grave was probably looted contemporaneously and is without any bronze objects or weaponry. Grave 27 is a young adult, buried in a rectangular surrounding structure that seems to be directly attached but still separated from the circular structure of grave 25. The structure is basically a two-thirds circle that is open to the west, towards the double row. The young adult's grave was not looted, and he also does not have a single bronze object in his burial inventory. The only decorated object is an eating bowl of type Bw 1a. He did, however, have two javelins of type 2 and a knife of type 1.

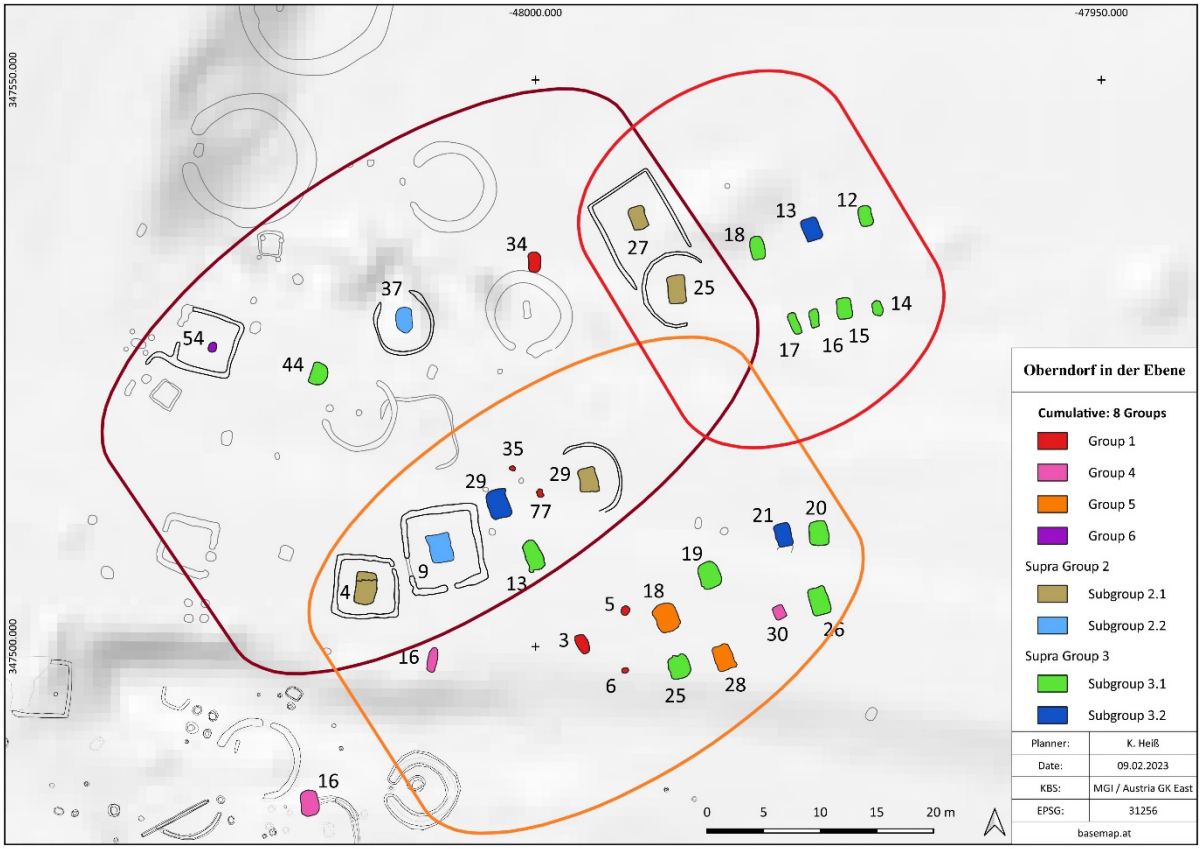


Fig. 23: The northern part of the Oberndorf cemetery based on the individual Oberndorf clustering. The Dark red frames marks the larger surrounding grouping. The 2 spatial groups. Th light orange and red frame mark the two spatial groups (map by K. Heiß).

The double row is placed directly east-southeast and is dominated by six burials of subgroup 3.1, with one additional grave from subgroup 3.2 [26]. The double row shares subgroup 3.1's characteristic

[26] As stated in chapter 11.3.2.1, in the individual clustering for Oberndorf, sub-group 3.2 became its own group 3.2.

youthfulness. The probable female in grave 16 is the only middle adult, whereas the female burial in grave 15 and the probable male burial in grave 17 each present a young adult. The remaining four graves are all child burials. Except for grave 27 within the rectangular surrounding structure, all graves have been either definitely or probably looted contemporaneously. Even though grave 25 shows signs of reopening and likely partial robbery, all of the graves in the double row are far more excessively disturbed (fig. 24). Despite its plundered and disturbed state, subgroup 3.2's child burial is by far the best-equipped grave in this geographical group, with 14 objects, 7 of which are decorated, i.a., two *Marzabotto* and one '*Vogelkopf*' fibula, a decorated double conic spindle whorl, and the remains of a beaded necklace in the form of an amber and two blue glass beads. In perspective, the second 'best-equipped' grave in this spatial group is the likely undisturbed weapon burial in grave 27, which has only six objects, of which only a bowl was decorated.

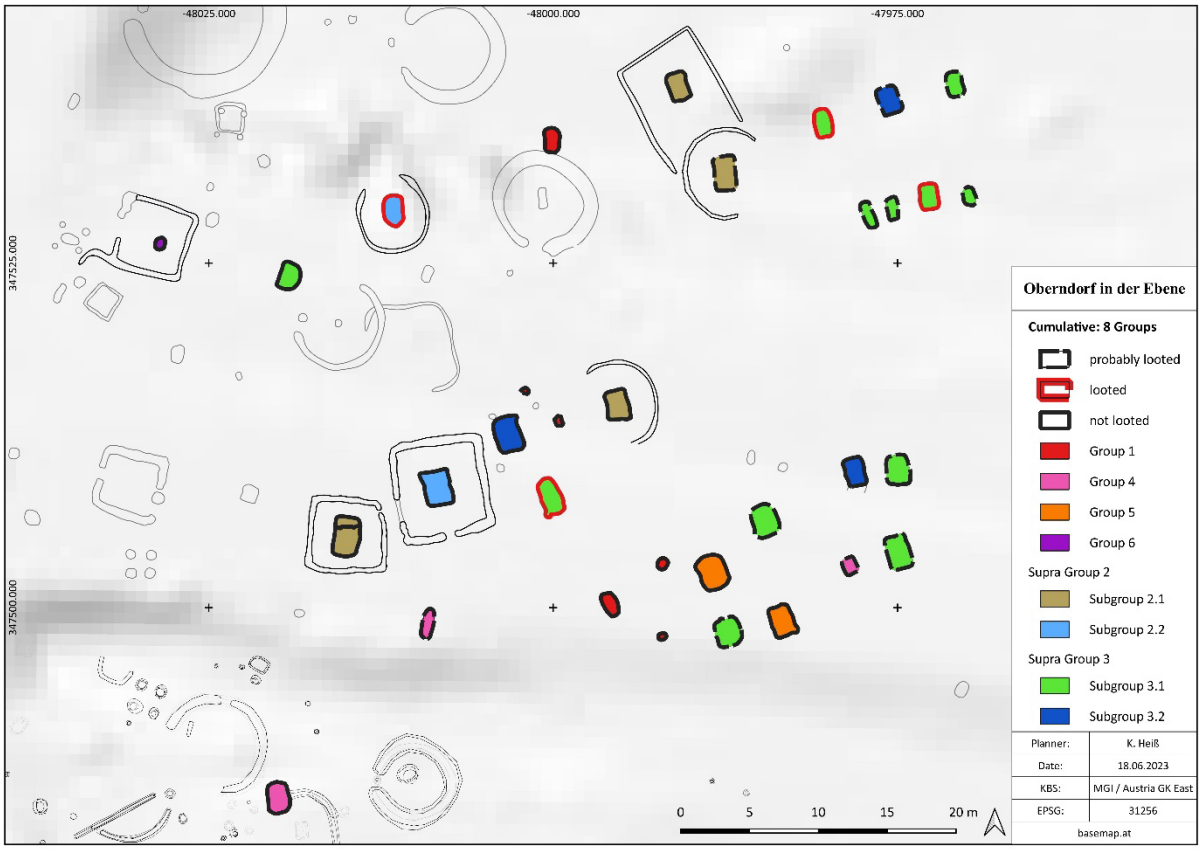


Fig. 24: Northern Section with information on contemporary post-depositional interaction (map by K. Heiß).

The second spatial group, although more intricate, follows the same pattern. This very diverse group consists of all cluster groups with the exception of group 6 and, aside from grave 34, all cremations from group 1. The actual surrounding group is apparently staged around grave 9's largest, square-shaped surrounding, and includes two inhumations and two cremations. Apart from grave 37, located about 15 metres to the north, grave 9 is the only definitive burial of elite subgroup 2.2 within the northern section. The possible male middle adult buried within this structure was one of only two

burials in subgroup 2.2 that were not looted and had a now-lost sword present when excavated. With the exceptions of the sword, one of two toiletry sets within the whole data set, and a silver ring, most of his 15 burial goods are relatively unexceptional. The lone bronze object is a needle-shaped fragment, while the only decorated objects are two small pots and a bowl. All of this leads to the assumption that graves 9 portrayed identity represents the middle spectrum of supra-group 2.

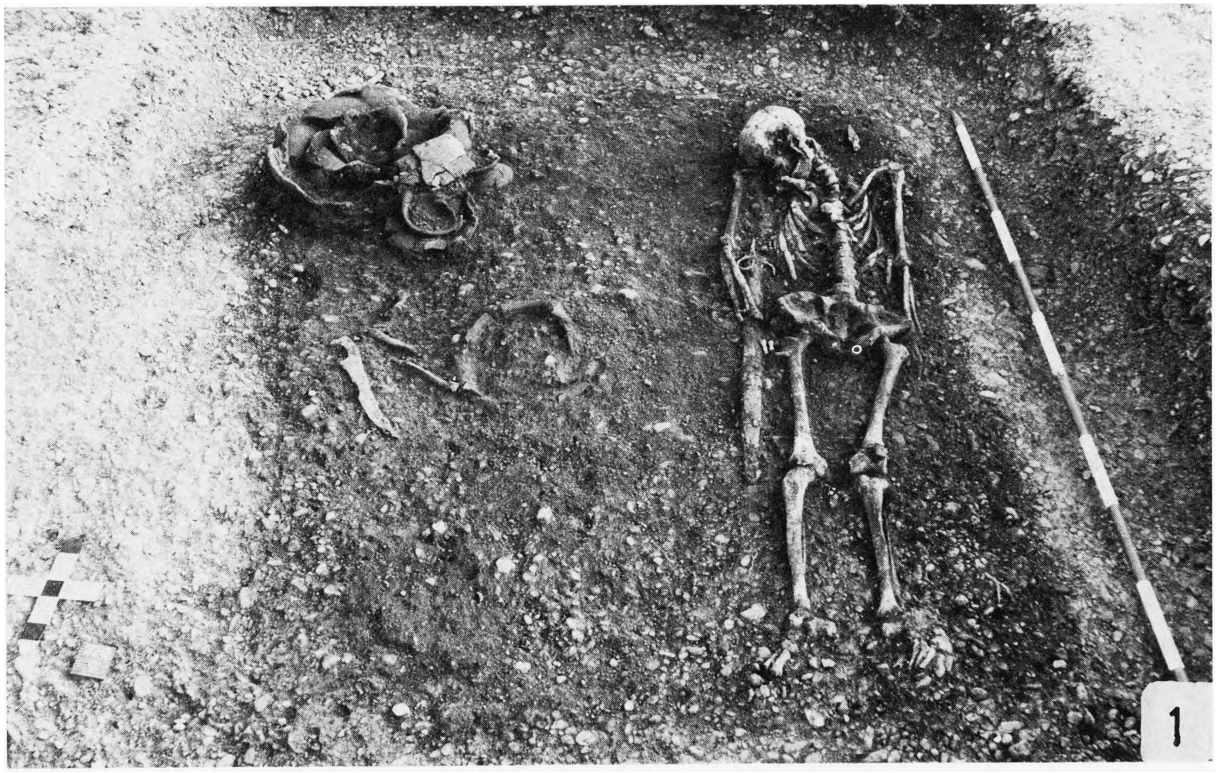


Fig. 25: Original excavation picture of grave 9 (FÖ, 21, 1982, 84, fig. 16.1).

Grave 9's surrounding structure shows an entry to the south and is almost square. It is flanked to the west by a smaller square surrounding, which contains grave 4. As stated above, this burial's assignment to subgroup 2.1 is questionable as it was severely destroyed in modern times. The remains of a scabbard strongly indicate that the male individual of unknown age was likely buried with a sword. As for the sword scabbard, two additional javelin or spear fragments, and a *Certosa* fibula this grave should be interpreted in a similar manner as grave 9.

The third surrounding of this spatial group seems to be an inverted copy of the above-mentioned two-thirds circular surrounding of grave 25, located approx. 15 m northeast. This variation, aside from being a half circle, is open to the west, not towards the double row but in direction to the four flat graves between grave 29 (OBD/04) and grave 9's surrounding structure. This middle adult male individual is a far more representative variant of subgroup 2.1, with only five objects, among them a bronze earring and two decorated vessels.

The four burials that make up the compact, interspersed flat grave cluster are as diverse as its whole spatial group. Two of these are graves 35 and 77, both cremations from group 1, with only one object each. Another is the likely female middle adult from grave 29 (OBD/82), subgroup 3.2, that as stated has the second highest number of artefacts in the data set. This burial is one of only four individuals buried with a spindle whorl. In this instance, there are three whorls, of which two are decorated. Finally, grave 13 is a middle adult male of subgroup 3.1 who has yet to be properly discussed. This grave was definitely looted contemporaneously, as its torso is heavily disturbed. Albeit speculative, the two still-remaining javelin heads placed above his skull, two large vessels, a knife, and the general bad state of the remains after the looting indicate that this burial was originally on average more richly equipped than most of the burials in subgroup 3.1.

Finally, the double row southeast of the above-described surrounding group. This double series of flat graves is fascinating in its own right, as it contains graves from five different group clusters. Among these 11 graves are group 1's unique warrior cremation in grave 3, the two adolescent female burials in grave 18, and the quadruple inhumations in grave 28. These graves have already been extensively discussed and interpreted due to their distinct character. Grave 3 is only one of three cremations, the others being the previously discussed graves 5 and 6, all grouped together at the western edge of the double row. Three of the four graves that changed from subgroup 3.1 to Oberndorf's local variation of subgroup 3.2 (cf. 11.3.1.3.2), namely graves 19, 25, and 26, are within this double row.

Starting from the three cremations, the row continues eastwards with the aforementioned graves 18 located in the upper row and a double burial consisting of an adult female and a child in grave 25 of subgroup 3.1 in the lower row. These are followed by grave 19, an adolescent of unknown sex, and south of this are the quadruple burials in grave 28. Set in between the remaining three graves of the double row to the east but without a counterpart above it, we find grave 30, a severely disturbed child burial of group 4. This is continued by subgroup 3.2's grave 21 in the upper row. As previously stated, this young adult male inhumation is the only individual with a sword added as a burial good that was not buried within a surrounding structure (cf. fig. 26). Below grave 21, grave 26 is a probably looted male individual of undetermined age from subgroup 3.1. Ultimately, the double row is concluded to the east with the burial of another child from the same subgroup in grave 20.

Fig. 26: Original excavation picture of grave 21 by Gattringer A. (Blesl, Gattringer, 2004, 29, fig. 25).

Most of the remaining graves in the northern section seem to be part of the multiphase structures in this area that can be found east and north of both described spatial groups. The cremation of grave 34, for example, which is only 10 m west of the surrounding grave 27, intersects a circular ditch, implying that this ditch likely dates from the late Bronze Age. The circular ditch northwest of grave 34, on the other hand, has been dated to the Early Roman Imperial period (Neugebauer and Gattringer, 1982, 67). South of both grave 44 and the probable female weapon grave 37 is a circular structure that superimposes a square structure of unknown date. The child in Grave 16 from the 2012 excavation (Morschhauser, 2012), between the northern and southern sections, was the only La Tène burial in this area and was actually intersected by an Early Roman Imperial surrounding system with several cremations of this period.

11.1.2 The Southern Section

The southern section is generally dominated by Late Bronze Age structures. North of that section is the area excavated in 2020 (Kultus and Kultus, 2021). This area is composed of various circular structures, particularly the large double circular ditch dated into the Late Bronze Age period of this cemetery. Although there is not a single definitive La Tène burial in this excavation section, not only are there both Early Roman Imperial Era and Late Hallstatt structures and cremations, but also one Early Bonze Age crouched inhumation and at least one definitive Epilengyel urn cremation.

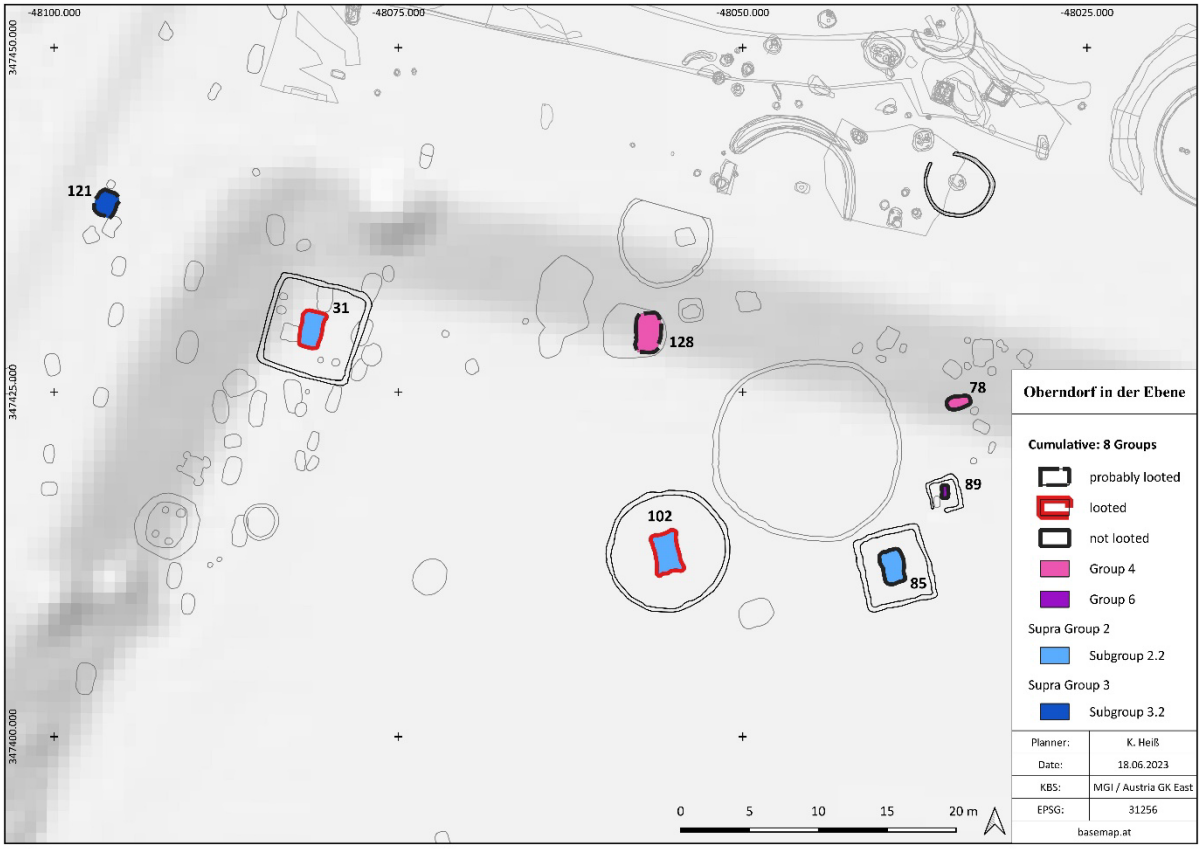


Fig. 27: Southern Section with information on contemporary post-depositional interaction (map by K. Heiß).

Notably, there is clear evidence that the La Tène burials in the south are orchestrated around older structures, as much as they are constructed above them seemingly without much care. The most straightforward example for this is grave 121, which is constructed almost congruently above a Late Hallstatt cremation (Neugebauer and Gattringer, 1982, 67).

The square surrounding with subgroup 2.2's middle adult spear carrier in grave 31, on the other hand, is constructed above several older structures without any sign of care. While four pit holes are considered part of the graves' surrounding system, the system itself intersects at least three older but undated pits or graves, as well as a fourth directly superimposed by grave 31. This area also contains several Early Bronze Age, Bell Beaker period crouched inhumations, two of which are less than ten metres west of grave 31 (Neugebauer and Gattringer, 1982, 66). This suggests that the area around grave 31 is an even older section of the cemetery, possibly unknown to the La Tène people. It is also notable that both graves 31 and 121 share an, for this period, untypical south-southeast and north-northwest orientation.

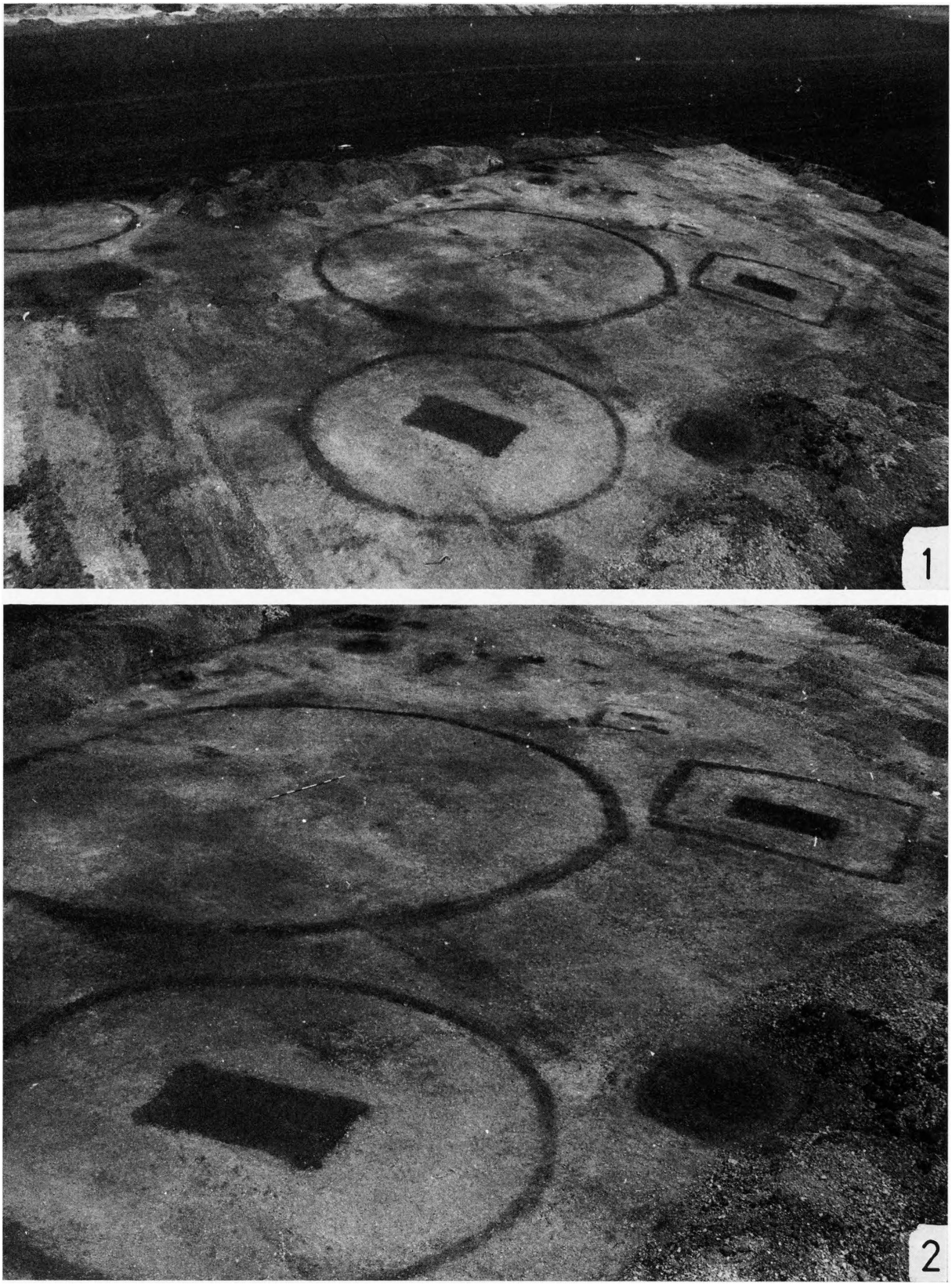


Fig. 28: Original excavation picture of the large undated circular ditch, grave 102 and its circular surrounding structure, as well as grave 85 and 89 with their square surrounding (FÖ 21, 1982, 7, fig. 19).

Finally, the actual southern spatial grouping, is composed of the three surrounding structures and the two group 4 flat inhumations that are placed around a large undated circular ditch. Due to the apparently deliberate staging around this circular trench, it cannot be younger than LT A. The most prominent burials are, of course, subgroup 2.2's already-debated female weapon burial in grave 102 and a rich child burial in grave 85. The latter is notable as, unlike most graves in its cluster group, it has not been looted and shares some unique burial goods, including an almost rectangular silex tool and two richly decorated fibulae, one *Fußzierfibel* and one *Doppelpaukenfibel*, among other burial goods. The infant cremation in grave 89 and another, undated but likely older grave occupy the third smaller, almost square surrounding. The last definitive member of this spatial group is grave 78, a flat inhumation of an unidentified adolescent, with only one vessel added as a burial good and no indication of grave robbery. This group 4 member also stands out for its untypical east-northeast and west-southwest orientation. Lastly, the young adult male in grave 118, likewise a member of group 4, may have been actually deposited south of the circular ditch right above it. However, it is unknown when this circular structure was built.

11.1.3 Interpretation of the Oberndorf Spatial Analysis

All three spatial groups have in common that they are clusters of graves staged around a group or, in the case of the southern spatial group, a single supposed elite grave. There are, however, clear differences. The southern group, in particular, consists mostly of three subgroups 3 and 7 elite graves buried in surrounding structures that are staged around a large circular ditch that may or may not be the remains of an older burial mount. The northern spatial groups are possibly updated variations of such a spatial installation, as both are groups of, or dominated by surrounding structures with a double row of flat graves immediately to their south-east. Importantly, the analytical separation of both northern groups is particularly artificial in regard to the larger collection of surroundings that can easily be considered one. This, nevertheless, would not negate the role of the satellite double row burial groups. Since families and their extended branches, retinue, and other percipients are at the core of Early Iron Age social structures, such local extended families are most likely the theme for these spatial displays.

Before interpreting the three spatial groups in more detail, it seems necessary to reinforce the chronological north–south axis. Although almost all periods can be found in the studied area of the cemetery, there is a clear trend that the northern section is dominated by La Tène burials and later Early Roman Imperial structures and graves. In the not-yet-excavated gap between the 2011 and 2020 excavations, graves, and structures from both of these periods become less common and gradually turn into the minority. Not only is the southern section dominated by Late Hallstatt burials and structures, but these are particularly prevalent in the southeast and are accompanied by several Early

Bronze Age burials. A continuation of the cemetery from that early on seems extremely unlikely, as there is no clear evidence for the incorporation or even acknowledgement of these graves.

In that light, the southern group can possibly be speculated to be remnants of a late Hallstatt core family. It is very likely that families have been the social core for Hallstatt period communities as much as they remain in that role in early La Tène communities and beyond (Earle and Kristiansen, 2010, 4; Fernández-Götz, 2014, 49; Rebay-Salisbury, 2016a, 50; Ramsl, 2020a, 18-19). This interpretation must remain theoretical as we do not have a date for the structure. That being said, most structures to its north, including the similarly large double circular ditches approx. 25 m northeast, have been dated to the cemeteries late Hallstatt phase. Both group 4 inhumations could not add any further evidence since for their lack of datable objects, they could not be dated more precisely than between HA D and LT B. The infant cremation, albeit similarly undatable, shows a hypothetical link towards the Late Hallstatt period if the second grave is considered from that time. The timeframe for both subgroup 2.2 burials is more precise as their burial goods allowed to date them towards LT A. Either however have objects that have strong Hallstatt traditions, particularly in each case a *Fußzierfibel* and grave 85's *Doppelpaukenfibel*. It is not necessarily relevant if such a direct correlation to a Late Hallstatt family is based on facts or is a later artificial projection of power as the intention for the spatial presentation remains the same.

As stated in the initial paragraph, the two northern spatial groups can very likely present an Early La Tène variation of the same intend. Regardless of whether the surrounding structures presented the final resting places for variations and branches of one or various core families, the spatial layout suggests in either case a deliberate correlation with the double rows. Without proper bioarchaeological analysis it must remain unclear if in some cases the individuals in double rows are also off branches of any core family. Thanks to the cluster analysis, we do however know that several burials within the double rows have their 'economic capital' far more conspicuously portrayed than subgroup 2.1 and consequently more similar to subgroup 2.2. Due to subgroup 2.1's interpretations as a local group of less prestigious elite and, or family members that seemingly were close enough to the core families to be buried within surrounding structure system but don't share their projection of wealth, it is fair to assess to material wealth was not the only essential projection of power. At least perceived, as many of the double row burials are seemingly deliberately richly staged.

There are several explanations for this divergence representation of 'economic capital' (cf. 8.3). Some of the objects can be rather seen as markers of occupational identity than mere wealth. This would hint to the plausible assumptions that some members of a family's retinue were successful craftsmen or merchants that transcendent the economic wealth and success of whichever 'landed gentry' they were the retinue from. It is also likely that such and other retinue included mobile agents that brought

their own, partially unique sets of individual and group identities along with them. Such mobile agents can serve as a suggested interpretation for the warrior cremation in grave 3 and the rich double inhumation of two female adolescent in grave 18. The latter could be a pair of regionally intermarried young women stemming from a wealthier region and that were not yet fully integrated before they died very young. Another interpretation could see these two female adolescents as traveling weavers, based on the fact that all spindle whorls in Oberndorf occur in rather rich graves from group 5 and subgroup 3.2, suggesting an importance for that craft. Of course, a combination of both readings is similarly possible. The implied varying nature of gender roles and how they intersected with other group identities will be debated in the closing discussion (cf. 14.3).

11.2 The Ossarn Cemetery Section

The spatial analysis of the La Tène section of the Ossarn cemetery only provides limited further information. Due to the aforementioned modern destruction of large parts of the site, this will likely not change in the future. The only burial within a surrounding structure is about 120 to 140 m southwest of all remaining analysed burials in Ossarn. This subgroup 2.1 burial in grave 25 is notable as it is neither richly endowed, has no weapons evident, nor shows definite signs for a grave robbery, but is the only grave within a double circular surrounding ditch. It is also noteworthy that this structure was probably placed directly atop several Early Bronze Age burials that represent the preserved northern extension of the Early Bronze Age cemetery section to the south (Melzer, 1962-1963, 45).

The cemetery area that most closely represents the original state and thus allows a limited spatial interpretation is the grave group at the north-west (fig. 30). Of those graves preserved well enough from this area to be analysed, the majority are from subgroup 3.1. The exceptions are three graves that are part of group 4, albeit for different reasons, and the adolescent in grave 17 of subgroup 3.2. The latter is one of two graves from Ossarn's' variant of subgroup 3.2, the other being the child burial in grave 1. Both of these two are the most lavishly endowed graves in Ossarn. While there seems to be no gravitational centre around which the graves are staged, it is still an intriguing mix of intersecting identities.

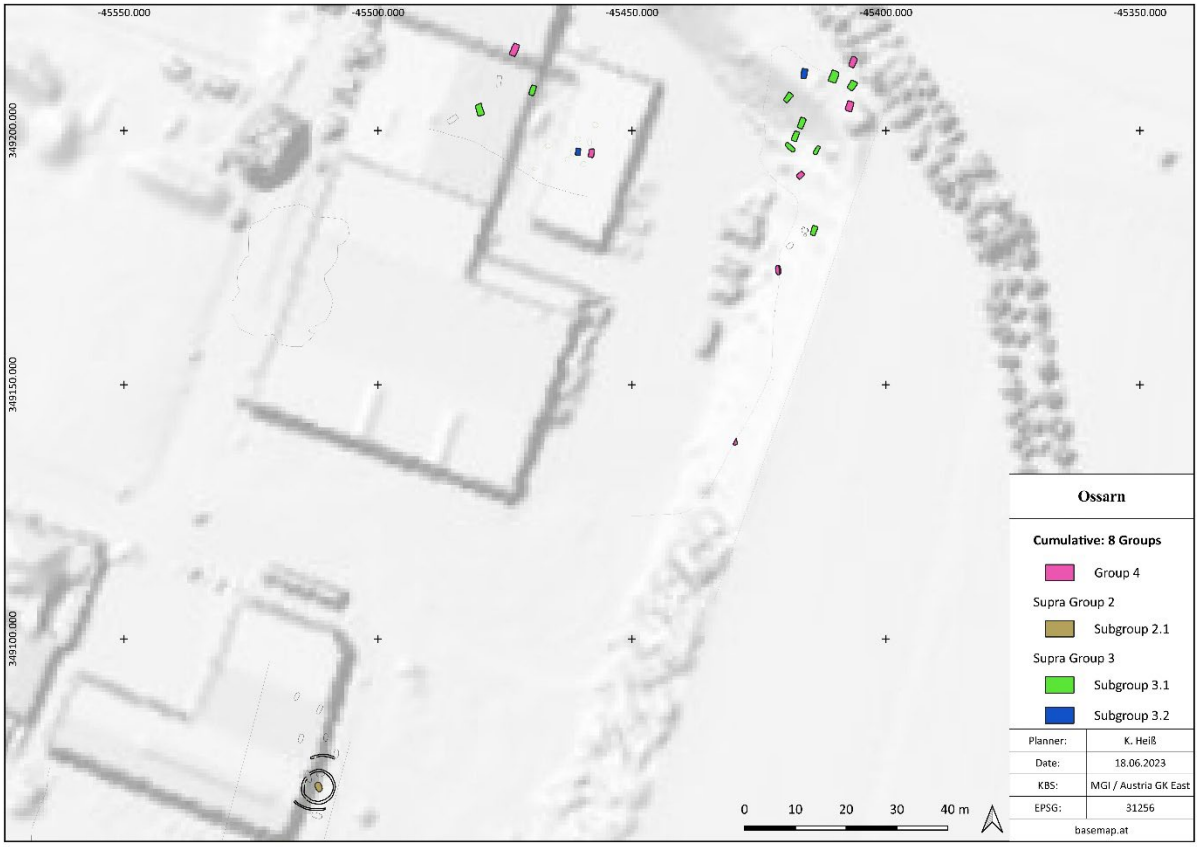


Fig. 29: Map of the whole area investigated in Ossarn (map by K. Heiß)

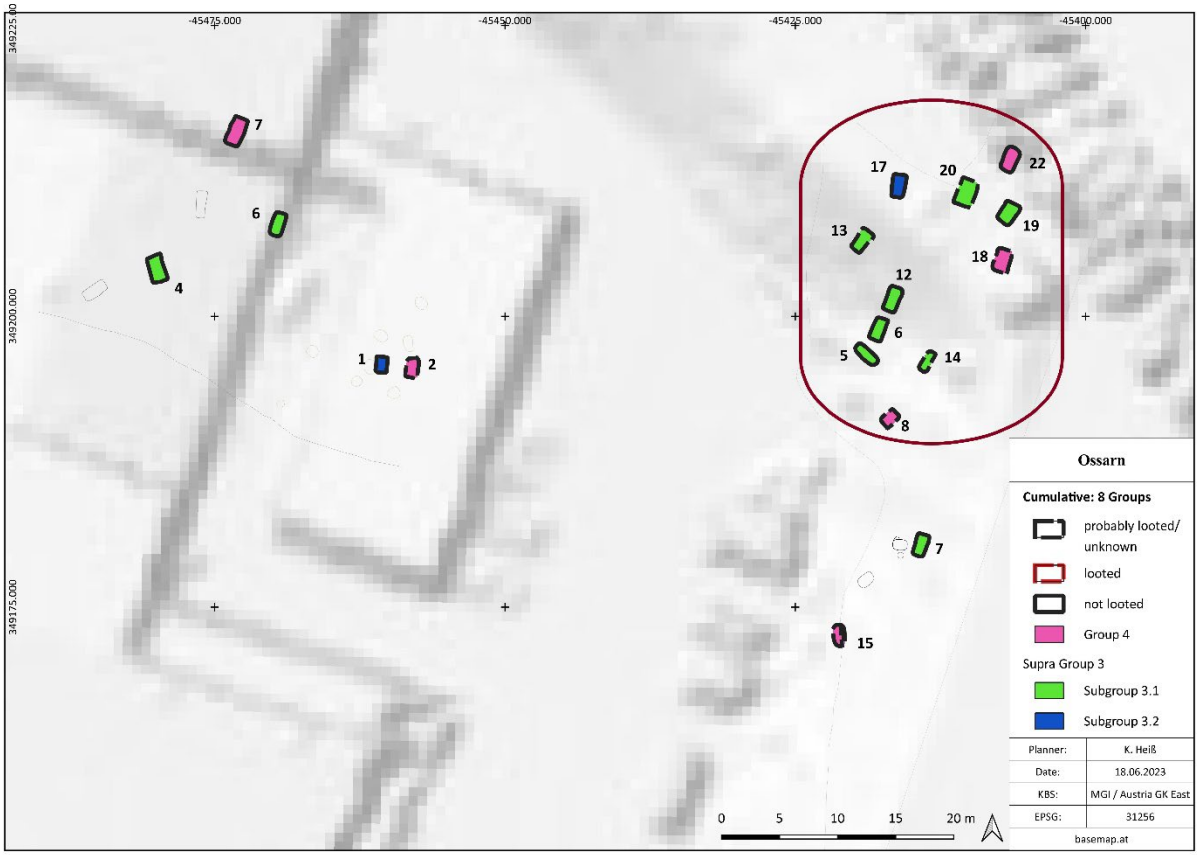


Fig. 30: Close up of the investigated area in the north-west with information on contemporary post-depositional interaction (map by K. Heiß).

Most of subgroup 3.1's graves share this group's cross-sex youthful characteristic. It consists mostly of three adolescents and two young adults, among the latter the female individual of grave 6 that is buried along with three cremations buried in a ceramic urn. The other three subgroup 3.1 graves are two middle adults, a female burial in grave 5, a male burial in grave 14, and one individual not further definable beyond being an adult. Grave 5 is unique, as it is a rare exception of a burial that is not south-north oriented but actually northwest-southeast. In addition to this unusual orientation, the female individual has the second most objects and decorated objects in this spatial group, after grave 17. It is also noteworthy that the quadruple mixed inhumation and cremation burial is located directly above grave 5. Those burials from group 4 are, as discussed, clustered for different reasons. The double middle adult burial in grave 18 is completely disturbed and likely contained more objects originally. Grave 8 is also a disturbed infant burial, whereas grave 22 is a possible adult buried only with animal bones and two further objects, whose grave shows no signs of looting.

While the remaining burials are too scattered, the above-described spatial group shows that something akin to a more diversely portrayed 'middle class' existed parallel to more standardised burial rite compositions. This diversity parallels that of the double rows in Oberndorf, whereas these were traced back to regional elite intermarriages or mobile agents of an elite retinue. The Ossarn example demonstrates that such diversity in intersecting identities does not always occur in conjunction with past and contemporary elite burials or monuments. That being said, it cannot be ruled out that a lost burial mount or any similar structure in proximity eroded over the last two millennia or has been destroyed in a similar manner as most of Ossarn's Early Iron Age cemetery.

11.3 The Inzersdorf Cemetery Section

Finally, the small section from the Inzersdorf cemetery site. Considering that they are entirely composed of deliberately placed surrounding structures, these graves and their organisation can be considered a spatial group in and of themselves. This group naturally consists only of supra-group 2 graves and one double cremation from group 6. Many burials in this group have been clustered between the fuzzy areas of subgroups 2.1 and 2.2. As a result, the grouping of some graves portrayed should be considered as part the middle ground between supra-group 2's subgroups. The young adult buried in looted grave 270, for instance, exhibits several '*Koppelringe*' and an openly worked belt plaque that could indicate a robbed sword, which are more typical of subgroup 3.1. The double cremation burial and the inhumations in graves 268 and 287 are the only burials that have definitely not been robbed. The latter being the infant burial attached to grave 288, for which, similar to grave 284, no clear statement on a robbery could be made. All remaining burials were definitely looted contemporaneously. However, only the bodies in graves 289 and 320 were disturbed in a significant manner.

Another additional aspect acting as a possible reference for some of these individuals' perceived importance are preserved post pits and remnants of wooden structures. This side aspect of the burial ritual, which has yet to be discussed in this thesis (cf. for a comprehensive summary: Ramsl, 2020d, 408-409), is uncommon, as many site formation processes can result in its absence. These post pits come in variations based on their position, either on all four corners as in grave 289 or in pairs on the centre left and right of a grave shaft, as evident in graves 270 and 279, respectively. Another rare occasion is the presence of wooden boxes or potential coffins, as in grave 284. These structures are still not determined as markers for class identity. For instance, the largely destroyed grave of a young adult female in grave 23 at Ossarn was also buried within a wooden coffin. Although this grave's grouping into group 4 must be argued to be due to its destruction, and consequent loss of objects, the remaining narrow grave shaft indicates a similar burial rite as most subgroup 3.1 burials in Ossarn. Additionally, we must expect that in most cases, remnants of such structures and coffins have been lost to time due to the aforesaid site formation processes or outdated excavation techniques.

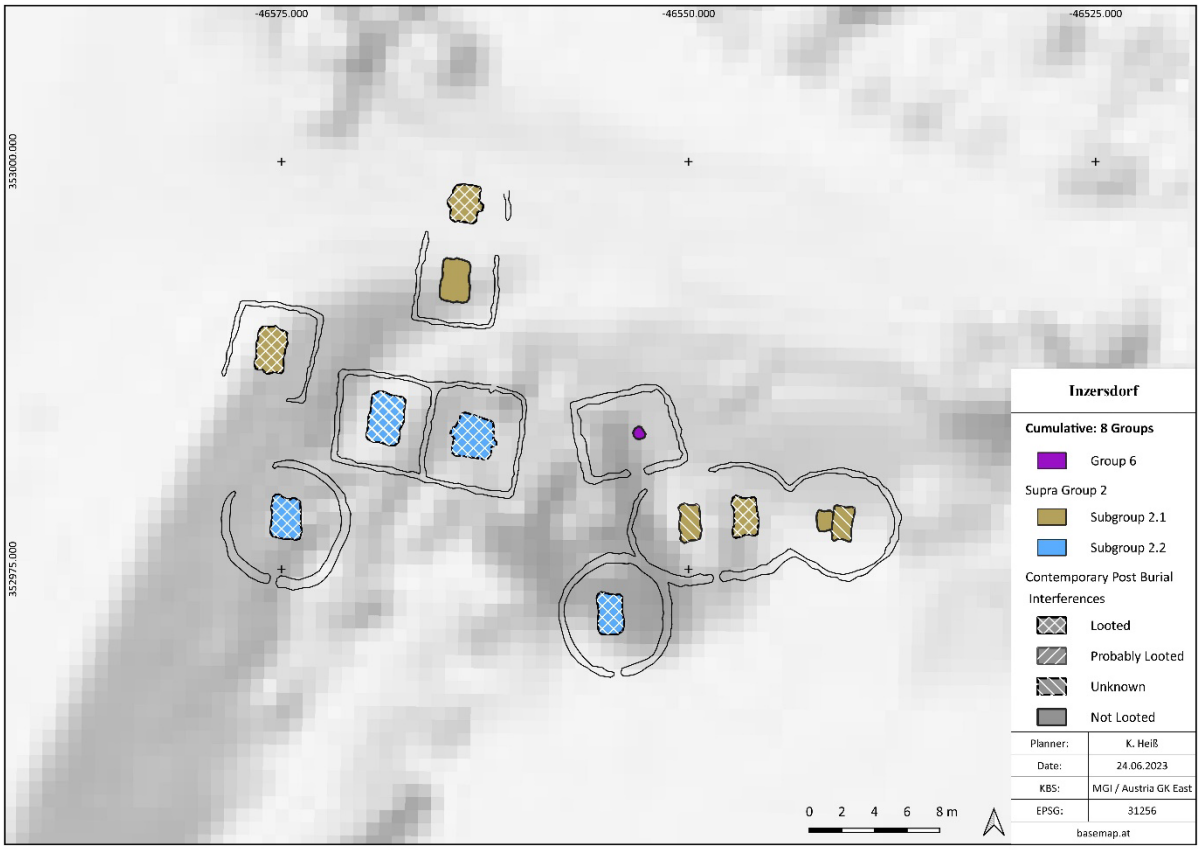


Fig. 31: The Inzersdorf area with information on contemporary post-depositional interaction (map by K. Heiß).

The surroundings were enacted amidst and partially above approx. 27 Urnfield culture cremations (Neugebauer, 1996b, 115). It can be argued that the gravitational centre of this spatial group is the two-part, seemingly closed rectangular surrounding system with graves 277 and 279. In fact, there are several similarities between these two burials. Both individuals were men, a young adult in grave 279

and a middle adult in grave 277. Their grave shafts are the largest [27] among the entire dataset, with a pair of post pits on the left and right centres, respectively. Both of these burials are endowed most lavishly among this spatial group and, albeit typical for subgroup 2.2, share a similar object combination. Finally, as stated above, either have a combination of *caprinae* and domestic pig bones as offerings, with additional cattle bones in 277.

This double surrounding system is flanked to the southwest and northwest by two solitary surroundings. Both contained the only definitive female individuals in Inzersdorf. The square surrounding, which is seemingly open to the south, contained grave 272, a middle adult. This individual was buried in a unique way as her legs were bent rhombically. Grave 320's female young adult was buried within a circular surrounding and its grave shaft shows post pits on all four corners. This burial was looted and heavily disturbed at its torso, but still contained enough objects and decorated objects to be clustered in subgroup 2.2.

North of the central double surrounding lies a similarly rectangular but partially open double surrounding system. Both individuals are male, a young adult in grave 270 and a middle adult in grave 268. As stated, grave 270 can easily be considered to be at the lower end of subgroup 2.2, unlike grave 268 that has an almost similar number of objects and decorated objects but shows no sign of grave robbery. Considering that the grave shaft in 270 is the third one with a centre pair of post pits and shows signs that it originally contained a sword, it can be assumed that the middle adult in 268 had a lower social rank than the young adult in 270.

Finally, to the east of the hypothetical spatial centre are the solitary square surrounding with a double cremation and the large quadruple or even quintuple surrounding system. Measured against the low comparative quantity of the remaining group 6 cremations, the adult and adolescent individuals in grave 282 stand out with three fairly striking objects: a *Vogelkopffibel*, a dress pin, and an iron nail clipper. The massive surrounding system consists of a large, slightly horizontal eight-shaped structure and grave 289's southwest-attached circular surrounding. Both structures have no entrances to each other. All graves inside the larger structure belong to subgroup 2.1 and all are male, aside from the infant burial in grave 287 that is attached to grave 288. The latter is the only old adult within the whole data set. The largest central section of the structure seems to open to the north and south at the intersection of the two semicircles. Buried inside this area are two young adults, albeit with different object categories. Grave 284 contains three javelin heads as burial goods, whereas grave 285 contains no weapons at all. Grave 285 is the only burial with signs of an albeit subtle grave robbery, and it is

[27] Grave 277 measures approx. 3.05 x 2.17 m and grave 289 approx. 2.70 x 2.35 m. In comparison, the second largest shaft in Inzersdorf belongs to grave 268 with 2.64 x 1.70 m, while the largest shaft outside of Inzersdorf is grave 34 from Oberndorf with approx. 2.65 x 1.65-1.30 m.

also the youngest addition to the structure as he is the only individual that could be dated as early as LT B1. As the remaining burials in this group do not show a definitive sign of grave robbery, the categorization of all four burials as subgroup 2.1 should be considered plausible. The attached, circular surrounding of grave 289 is opened to the south. This adolescent of unknown sex is the most disturbed in Inzersdorf and appears to have been heavily looted. However, even in this burial, the pattern of subgroup 2.2 is maintained, as the tomb nevertheless still has more objects and decorated objects than all the subgroup 2.1 graves in the large adjacent structure.

Similarly, to the results of the individual cemetery cluster (cf. 11.3.2), any interpretation of the Inzersdorf group must be based on comparisons to the other cemeteries as it lacks any local point of reference. However, there are clear trends and patterns that this group continues to follow. For one, graves 282 and 320 validate the pattern that all four definitive female individuals of supra-group 2 are middle or young adults buried within a solidary surrounding structure [28]. All three members of subgroup 2.2 are buried within a circular surrounding; only subgroup 2.1's grave 272 was found within a rectangular structure. All four graves are looted contemporaneously, although grave 272 looting was far less intrusive. While grave 320 is similarly extensively disturbed as the other two female subgroup 2.2 burials from Oberndorf, it lacks any indication or proof for weapons. That being said, it seems even luckier that the javelin in Oberndorf's grave 37 of and the '*Koppelring*' in 102 were found considering the state of both burial remains. On the other hand, the age distributions, and ordinary portrayals of economic capital within the large surrounding system add credence to the theory that the elite group buried within many of the surroundings is indeed an extended family.

12 Final Discussion

After conducting the spatial analysis on each of the three individual cemeteries and cross-examining them with between-group statistical comparisons as well as their individual anatomical ages, sexes, and additional contextual information, a hypothesised social order could be determined. These social groupings remain rough interpretations and are not self-contained groups. The latter has been shown by a number of graves that fell into the fuzzy area between cluster groups, hence should be considered as natural links between groups. Also, any such retrospectively interpreted social classes must not have necessarily been considered as such during their existence. Any perceived social rank or material wealth is highly subjective and relative, even within a contemporary community.

[28] The theoretical fifth, secondary female burial in grave 31 must be critically reviewed. It was already noted in the received documentation that it is very unclear if these remains were actually part of a double burial or even from a female individual. Considering grave 31's localization directly above a number of Early Bronze Age burials (cf. fig.), this doubt seems even more justified. Hence the exclusion of this grave from the discussion.

Furthermore, two main arguments related to group identities and their correlation to the local social order have been identified and will be the main topic of the closing discussion:

(1) The examined cluster groups display a flat social hierarchy that seems to be based on variations in projected material wealth and/or membership in, or affiliation with, one or more elite groups buried within surrounding structures. These elite groups, in theory, likely depict a local core family (cf. 7.2.2).
(2) Power dynamics within this hierarchy are correlated with differing intersecting gender, age, class, and occupational group identities, particularly in cases of class and female identities.

Aside from the clustering results, these propositions are built on established archaeological, and holistically enriched theoretical frameworks. As a result, we can draw conclusions about the fertile valley's agrarian (cf., 7.2.1; Neugebauer, 1992, 47; Kohler-Schneider and Trebsche, 2020, 48) and interregional (cf. 7.2.2; Zeiler, Ramsl, Jerem, et al., 2010; Ramsl, 2018b), well-connected characterisation. Because of its strategic location on a Danube tributary, the valley is situated at a crossroads of trade and communication networks, with access to the Traisen- and Kamp Valleys to the north and south, and the Danube to the east and west (cf. Ramsl, 2020a, 71).

All this combined, strongly suggests that the Valley's population did not exist in a remote bubble. In addition to geographical implications, there is archaeological evidence hinting towards an interregional networking, such as aforementioned '*Vekerzug*' ware and '*Geriefte Drehscheibenkeramik*' evident in Inzersdorf – Walpersdorf that point to Eastern and Western central settlements (cf. 7.2.1.1; Ramsl, 1995, 27), or burial goods that suggest a connection with East France (Ramsl, 2020b, 374), Switzerland (Ramsl, 2011, 117-118; Trebsche, Bagley, Karwowski, et al., 2020, 474) or Central Bohemia (Trebsche, Bagley, Karwowski, et al., 2020, 474). This implies that at least a few core elite members, mercenaries, regional craftspeople, or merchants, shared some level of mobility. Of course, either the scale of mobility and the amount of mobile agents in any community are again relative, as shown by bioarchaeometric ($^{87}Sr/^{86}Sr$ and $\delta^{18}O$) research on five Central European Early La Tène cemetery sites (cf. Scheeres, 2014, 114-116). Any such mobile agent likely would have experienced interregional social structures with corresponding social and material transformations. A dynamic like this would naturally amplify during times like the titular transitional period.

Many more specific assessments drawn from the quantitative and spatial observations are, of course, primarily applicable for the Oberndorf cemetery, as the majority of examined data originate from here. That being said, the cumulative clustering and spatial analysis of Ossarn and Inzersdorf, as presented, reinforce several observed trends in Oberndorf. It is therefore likely that the following considerations are applicable for most similarly organised Traisen Valley communities within the timeframe. This

statement, however, in no way negates varying concurrent social structures. One primary argument for the interpretation of local social hierarchies is based on the Valleys' character as a likely agrarian production centre. Whether a given location served as a political, religious, military, or production hub directly correlates with the degree to which power was centralised there (cf. Carneiro, 1981; Golec and Mírová, 2020, 125). Thus, it is entirely plausible that any nearby central settlement or ritual site that has not yet been discovered had its own local social organisation.

12.1 Translating Cluster Groups into Social Classes

Before concluding this final discussion with a line of arguments for the above stated propositions, the identified social groups should be briefly summarised. These groups are translations of the derived cumulative cluster groups and can be consequently divided into four base social classes and a fifth overlapping group:

(1) **A local elite** that likely can be correlated with a core family. These graves are all intentionally spatially staged in solitary or groups of surrounding structures. Due to differences in burial rite, portrayed material wealth, anatomical sex, the number of looted graves, and object composition, this larger group can be further divided into three more distinct subgroups. Two of these equate with supra-group 2 and its subgroups. The third consists of cremations from group 6 buried within similar surroundings.

(2) **A wealthy group of commoners** that can be interpreted as the core elite's economically successful retinue, such as 'attached specialists' [29]. This diverse group is portrayed with a strong emphasis on their material wealth, specifically compared with elite subgroup 2.1. Particularly in Oberndorf, these graves appear to be deliberately arranged in relation to certain elite surrounding assembles. This group consists of several different intersecting group identities and is the equivalent of group 5, subgroup 3.2, and at least three cremations of group 1.

(3) **An averagely equipped group of commoners** which is also the largest group. This group can be interpreted as the social core of farmers or commoners in general. Spatially, this group can be found in individual groups and in relation to surrounding structures. More than half of this group died before the age of 35, with 40% dying before the age of 20. The young age average can be explained by a high infant and child mortality rate. This group equates mostly with subgroup 3.1 but features a fluent transition to group 4 and subgroup 3.2.

[29] Attached specialists are craftspeople who produce goods or provide services directly under the backing or patronage of an authority figure or other social elites (Brumfiel and Earle, 1987, 5; Junker, 1994, 3).

(4) A small group of nine inhumations, with a very low count of at most four or non-objects. Since this group consists of at least three children and infants, this group can be interpreted as **a mixture of child and infant deaths of the commoner group** and individuals that, for one reason or another, were buried in a manner that suggests a **low social rank**. All ages and sexes are represented in this group. However, for the majority, their sex was not determinable. This group corresponds to the majority of group 4 graves.

(5) Finally, despite not being a true social group, there were seven cremations that could not be classified into any group due to their state and consequent lack of data. This group consists of the remaining three cremations from group 1 and four secondary cremations from subgroup 3.1.

12.2 A Flat Hierarchy Based on Linage and Economic Capital

As noted, this aspect of the interpretation is strongly premised on the Valleys' community's interpretation as largely interconnected, agrarian focused, smaller farmsteads and larger villages (cf. 8.2, Neugebauer, 1992, 47; Ramsl, 1995, 48). Some elites and mobile agents were most likely aware of their regional society's role within a theoretical subjectively perceived, sub-ethnic community defined by Ramsl (2020b, 368) as the North-Eastern Austrian Group, or in any case communalities with the Leithagebirge, as well as the Váh- and Sopron regions. Such regional connections are observable by, i.a., identical pottery stamps (Zeiler, Ramsl, Jerem, et al., 2010, 272, fig. 13; Ramsl, 2020a, 20) and at least suggest an established regional communication and trading network.

The argument here, however, is that for the majority of common people living as farmers or local and regional craftsmen and women, most aspects of their 'ethnic identity' were feasibly only of minor relevance. Their social structural foundation were the core families, which were further connected to extended family groups, or 'costumegroups' (cf. Ramsl, 2018b, 41-42). As presented, supra-group 2 and the cremation group 6 are likely candidates for a local variation of such a core family. The question remains as to how these core families are tied to their extended family branches, retinue, and individuals outside of these leading families in terms of the social power dynamic.

Whether a related family is present or not, the most stringent representation of social status in the analysed data, aside from burial structures, appears to be material wealth. Naturally, we must again be aware that our perception of past economic wealth must not be equated with modern expressions of capitalism. We can, however, assume that any local community with a focus on any form of production that is interconnected with at least regional trading networks will form some variation of economic centralization and correlated local power structures. The most important indication for this is subgroup 2.2 itself. This group, interpreted as the actual leading figures of the local core family, is characterised as much by their reflected material wealth as by the surrounding structures that serve

as spatial and ritualistic reflections of power. Even the fact that all but one of this group's graves have been heavily disturbed and looted contemporaneously can be taken as an indicator of their status or the posthumous loss of it.

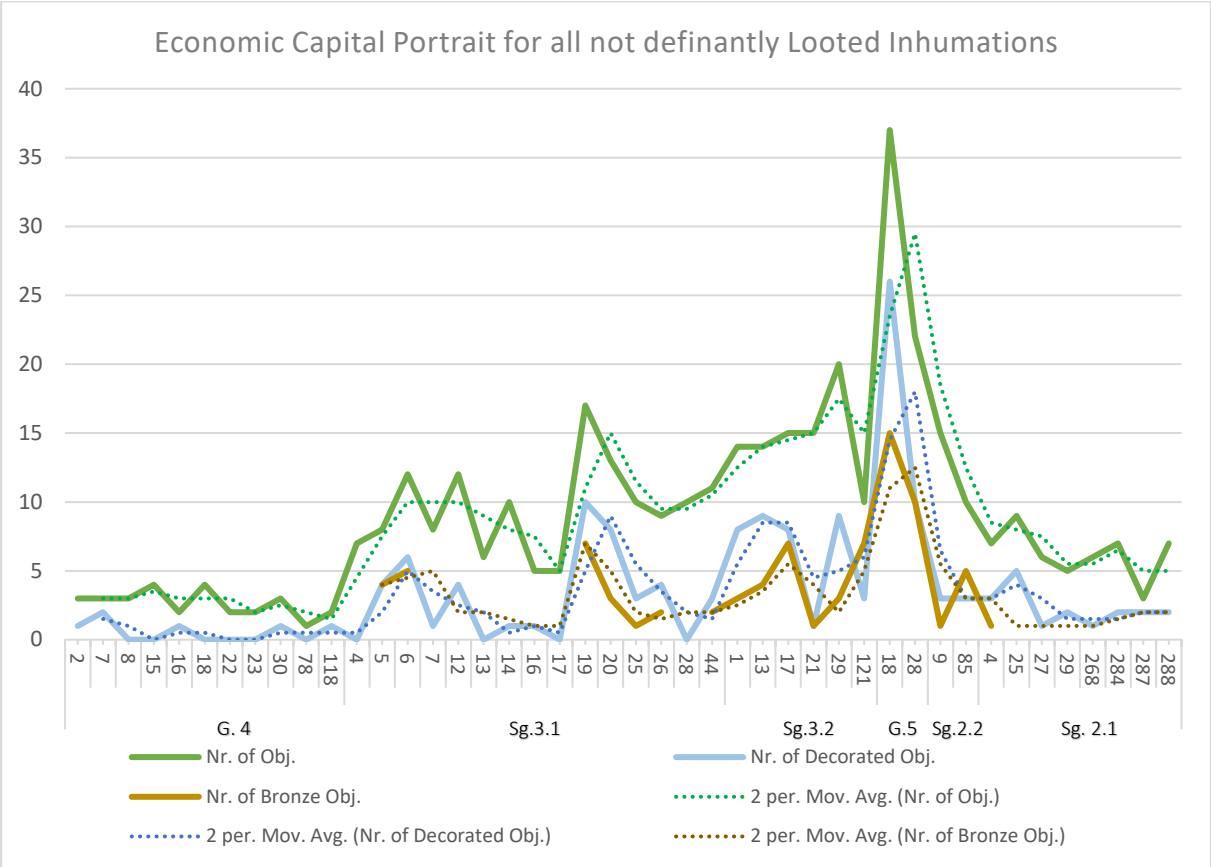
This consequently leads to the implication that the above-stated 'wealthy group of commoners' maybe represents a concurrent, perhaps emerging, economy-based elite. Consisting of subgroup 3.2 and group 5, this group perhaps depicts a variety of local or mobile craftsmen, attached or independent specialists, as well as mobile agents, mercenaries, participants in interregional marriages, and travelling craftsmen or merchants. Although buried outside of the elaborate structures of the core families or core elites, these individuals may have been able to distinguish themselves within the regional and even supra-regional economic network. This group stands in stark contrast to subgroup 2.1, which consists predominantly of weapons-focused male individuals buried inside elaborately constructed surroundings but without any significant emphasis on their 'economic capital' (cf. 8.3).

Nevertheless, subgroup 2.1 may also indicate that a number of community members did not share the relative equation of social rank and economic wealth. It is rather more plausible that power and social status were perceived and reflected in various forms at the same time. The most glaring but missing example of this would be the elusive position of any spiritual leaders. For all we know, some community members in the Traisen Valley might have very well perceived subgroup 2.2 as part of the elite because of their lineage and/or their prestige as warriors but considered subgroup 3.2 and group 5 as upstarts, while other members did exactly the opposite.

Of course, just as portrait economic wealth is not a determining factor for power, neither is the number of decorated objects, bronze objects, or certain object categories necessarily a depiction of 'economic capital'. For instance, while male burials in both elite subgroups 2.1 and 2.2 have an emphasis on iron objects (cf. diagram), subgroup 2.2 still has a sizeable number of bronze objects, whereas in burials of subgroup 2.1 bronze objects are mostly entirely absent. This could indicate that for some group identities, a large quantity of decorated adornments might be more of a portrayal of their 'social capital'.

As established (cf. 12.1.2.2 and 12.1.3.1), bronze bracelets and anklets are recurring accessories for Iron Age women's costumes beyond their social ranks or age group. A blacksmith might have gotten a high quantity of his products added as burial goods additionally to smithing tools, not to portray an 'economic capital', but as a portrayal of his or her occupational identity (cf. for variations of potentially portrayed metal related craftmen identities: for Au, Kleine Hutweide: Nebehay, 1973, grave 13; for St. Georgen am Steinfeld: Neugebauer, 1992, 101, fig. 37; for Malé Kosiky: Bujna, 1995, grave 149: 37-41 and table 17; grave 176: table 19-20; for Mannersdorf: Ramsl, 2011, grave 22: 43-44, tables 55-59, grave 212: 95-97, tables 200-205; also for a more comprehensive overview: Ramsl, 2020a, 169-170).

Such examples, however, never contradict one another, since it is very likely that mourners incorporated multiple meanings into any burial goods composition. This serves as a particularly important reason why evaluations of economic wealth in burials should be based on a quantitative basis, as it allows for the depiction of a statistical mean (cf. diagram below).



Whether portrait economic wealth in burials was intended to represent ‘economic capital’, ‘social capital’, or a combination of the two, this material wealth is relatively evenly distributed across all group clusters. The hierarchies depicted in the burial rituals, apart from surrounding structures, are shown to be quite flat (cf. diagram above). The commoner subgroup 3.1, generally, has a higher average number in this regard than the warrior subgroup 2.1, buried within their surroundings. The wealthy portrait ‘middle class’ consisting of subgroup 3.2 and the outlier graves from group 5, leads these statistics in almost all fields, even in regard to those two not-looted graves from subgroup 2.2.

We must, however, assume that the core elite subgroup 2.2 originally portrayed their 'economic' or 'social capital' far more elaborately. This has been shown by analogies of elite burials within surrounding structures, as the male burial from Pottenbrunn in grave 562 (Ramsl, 2002, 46-48) or Mannersdorf’s female grave 13 (Ramsl, 2011, 41-43 and tables 48-54), as well as subgroups 3’s generally sizeable number of objects, whether decorated, iron or bronze, that is contrasted with its almost entirely robbed status. This also supports the partial interpretation of both subgroup 3.2 and group 5 as regional, maybe even supra-regional, merchants or craftsperson. From a purely economic

point of view, any such mobility leads to increasing sales markets and, consequently, prosperity. Curiously, it is precisely these groups, along with subgroup 2.2, whose gender systematics do not adhere to simultaneously existing predetermined standard criteria.

12.3 Intersecting Local Gender, Age, and Class Identities

One of the primary goals of this thesis was to illustrate group identities in their entire, tangible, and intersecting complexity. The quantitative analysis of the Traisen Valley Early Iron Age cemeteries and their interpretation have shown several potential group identity intersections, specifically the intersections of class, gender, age, and occupational identities. Many further group identity layers, such as kinship or religion, remained for different reasons either too intangible, unavailable, or a matter of interpretation based on additional contextual or spatial analysis.

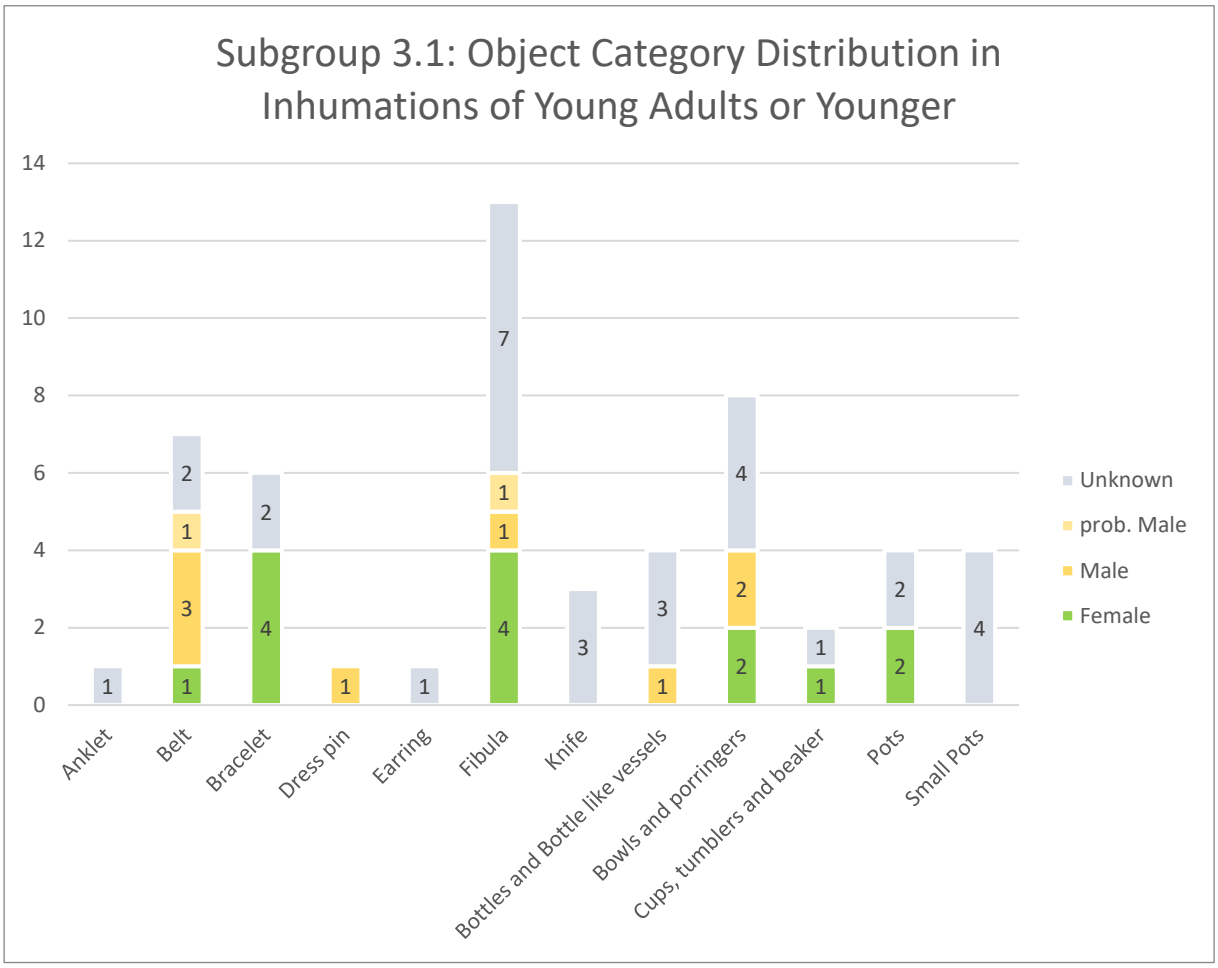
Even without these additional aspects, the final results verify that the complexity of identities and constituted social roles beyond base concepts like gender, class, or religion, were recognized in the communal burial rite. Importantly, many group identity intersections observed within the analysed cluster groups indicate that one portrayed group identity superimposes others. Here in particular the above discussed social hierarchy. Other group identity intersections must remain ambiguous. Specifically, the likely significance of potential religious identities behind variations of cremations and inhumations. The only definite statement in this regard is that the variety of 16.09% cremation burials within the entire data set occurs across almost all suggested social strata but without any further apparent quantifiable pattern.

The most conspicuous examples of group identity intersections stem from gender roles, particularly those of women. Even as the often stated male dominance in Central European Iron Age societies (Jud, 2006, 91; Müller, 2009; Fernández-Götz, 2014, 25 and 101; Rebay-Salisbury, 2016a, 250) remains statistically evident in the overall number of male burials in the elite supra-group 2, a considerable number of female outlier burials, in particular the three weapon related ones, indicate that any such male dominance was neither clear cut and impeded by other intersecting group identities of female individuals. The data analysis suggests further that local, standardised Iron Age female gender roles and more novel depictions of women in graves coexisted, depending on their class, age, or potential occupation. This point is best illustrated by looking at the distribution of bracelets, weapons, and spindle whorls, all of which are traditional gender identity marker [30] for this time period.

[30] Cf. chapter 8.4 for a critical deconstruction of the concept of identity markers.

12.3.1 Standardised Gender, Age, and Class Identities

To begin with, female burials of subgroup 3.1 which primarily consists of young individuals, are seemingly more normatively portrayed. Although these include one adult and one middle adult, all five definitive female inhumations in this group, that are neither looted nor destroyed share a pair of bronze arm rings as burial goods. The majority of subgroup 3.1's individuals that died at least below approx. the age of 35, share a humble standard composition, consisting of basic sets of additional vessels and fibulae, the occasional knife and belt hook, whereas unique objects, such as a single anklet, dress pin or earring remain the exception (cf. diagram below). This distribution, if compared to other smaller numbered cluster groups, with likely higher social rankings and average ages, suggests that this standardized portrayal is likely based on many of subgroup 3.1's individuals age, rather than their gender identity.



In contrast to the above-observed trend, the number of the aforementioned non-standardised female burials increases from the age category of adolescence onwards, and even more so depending on their potential social class. Interestingly, despite other portrayed distinctions to subgroup 3.1, all female inhumations of the entire data set without any definitive indication of grave robbery or destruction, have also at least two bronze bracelets added as burial goods. Additionally, many female burials that

have been definitely or likely looted, such as grave 272 (INZ) or grave 25 (OBD/82), show signs of disturbance in the wrist area. This implies that there are no apparent differences in bracelet distribution across female age or class groups. At least observable in this data set, since in Mannersdorf (Ramsl, 2011, 239, fig. 192 and 240, fig. 193), the number of bracelets on each arm has been shown to directly correlate with the buried individual's age. Whether this discrepancy is attributable to the high rate of grave robbery in the analysed burial data, or Mannersdorf's already discussed regional idiosyncrasies in bracelet and anklet customs, cannot be answered conclusively. Regardless, the quantitative analysis depicts bracelets on each arm as a surprisingly consistent identity marker, coexisting alongside divergences in other depicted gender standards.

12.3.2 Spindle Whorls as a Potential Occupational Identity Marker

Although not a divergence in gender roles, the distribution of spindle whorls is intriguing as it suggests an intersection of gender identities and class, and occupational identities. Within the analysed data, only four inhumations had spindle whorls added as burial goods. Since these are the two female adolescents from grave 18 (OBD/82) and the middle adult female from grave 29 (OBD/82), not only are three of these burials part of the wealthy commoner group, but they are also the wealthiest portrayed undisturbed burials in the entire data set. The fourth burial is the sex-wise undetermined and likely looted child burial in grave 13 (OBD/04), which is also part of group 5.

By comparison, within the nearby site of Pottenbrunn, only three spindle whorls are evident overall. Two of these objects belong to graves that are dated either too early (grave 8) or too late (grave 38) for this thesis's spatial limitations. The third, however, is intriguing because it is an old adult male dating to LT B from grave 565 (Ramsl, 2002, 145). Albeit it is not entirely uncommon for contemporary elderly male individuals to be buried with spindle whorls (cf. for a potential example from Dürrnberg: Pauli, 1975, 261, fn. 121; for a combination of a sword and a spindle whorl from Malé Kosihy: Bujna, 1995, table 49B; Ramsl, 2020a, 165), it is still a rare divergence (Grömer, Hofmann-de Keijzer, Rösel-Mautendorfer, et al., 2016, 273). Thus, the question arises if the spindle whorl in this old adult male burial portrays an individual outlier or if there is a hidden identity intersection between a small demographic of elderly males and grave 13's child, the two adolescent females from grave 18 and the adult woman from grave 29. Due to the diversity in gender and age identities, the most plausible common denominator would be their class, or rather their occupational identity [31].

[31] Pottenbrunn's grave 565 extensively contemporary looted state, makes this assumption both, plausible since such lootings can be seen as class identity markers as discussed in 8.5.2 and still highly speculative due to the state of the burial context.

Either way, the evidence of decorated spindle whorls within graves 18, 29 and 13 could be an indication that, at least in Oberndorf, weaving was either a more renowned craft in general, or these women produced textiles that were directly geared towards their elite as a target market. This hypothesis would consequently see these individuals as attached specialists (Brumfiel and Earle, 1987, 5; Grömer, Hofmann-de Keijzer, Rösel-Mautendorfer, et al., 2016, 252-255). Traditionally, such specialist craftspeople and artisans who are in direct dependence on elites are often related to "central place redistribution" (Renfrew, 1975, 43). However, neither a central settlement nor its absence are determining factors. While supra-regional elites likely gathered their attached specialists in central places to control both the distribution and the production of maybe politically essential goods (Brumfiel and Earle, 1987, 5; Junker, 1994, 3), more local, landed elites would gather their own specialists wherever they located or maybe even allow them to remain regional mobile craftspeople.

Even though Hallstatt period textile production was largely based on attached specialists, the current scientific consensus points to the rise of mass production of textiles during the La Tène period within the spatial limitations of this thesis and beyond (Grömer, Hofmann-de Keijzer, Rösel-Mautendorfer, et al., 2016, 83 and 256-258). Of course, mass production and specialists, as much as central trading places and mobile craftspeople are not mutually exclusive. More so within a timeframe that only sees the emergence of centralized workshop and mass production (Grömer, Hofmann-de Keijzer, Rösel-Mautendorfer, et al., 2016, 259-260). It seems therefore entirely plausible that some attached specialists also acted as mobile agents and maybe were part-time 'independent specialists' (Brumfiel and Earle, 1987, 5-6) that also distributed more 'mundane' products for common people. Either interpretation, in addition to the clustering results, spatial analysis, and burial contexts, would lend credence to the interpretation that both graves 18 and 29 were likely occupied by socially higher-placed local or regional craftswomen.

12.3.3 Female Weapon Burials and Different Intersecting Class Identities

This finally leads to a similarly rare divergence: female burials with weapons (cf. Ramsl, 2020a, 167-168). Any assessment on the scarcity of burials with diverging traditional identity markers, regardless of whether the average is statistically plausible or not, must always consider that an unknown number of burials had been categorized based on these markers in the past, not their anatomical sex or age (i.a.: Jud, 2006, 91-92). Considering this, a total number of three weapon related female burials in Oberndorf still seems to be surprisingly significant. All three have already been discussed in more detail over the course of several preceding chapters (cf. 9.5.1 and 12.1.2.2).

Briefly summarized, two of these are subgroup 3.1 elite burials: Grave 37 which is the only definitive anthropological determined female with weapons still present in her severely disturbed and looted burial. The equally robbed grave 102, that has two '*Koppelringe'* evident, which are considered clear

indicators for a weapon belt in male burials [32]. Finally, the upper left adolescent from the quadruple burial of grave 28. For this individual no sex could be determined but it has two bronze bracelets on each arm, a chain link necklace, and a javelin head at the upper left of its head. This rare combination suggests either a rare male burial with two bracelets and a necklace, or another female weapon burial [33]. However, as presented above, double bronze bracelets are, at least in this data set, a statistically evident indicator for female identity. This leaves a female weapon burial more likely in this specific case.

When discussing motives and identity intersection, it must be emphasized that the presence of weapon burials is not a determining attribute for a warrior, male or female. Much like the above discussed relativity of 'economic' or 'social capital' of adornments, the addition of weapons in burials serves as a variety of, often complementary 'symbolic capitals'. While many of these indeed indicate a warrior identity, others may be mere expressions of an elite status. La Tène warriors generally are described in ancient sources with their own variety of class or religious identities and weapon categories, gradually developing and branching over time (cf. for an extensive overview: Dobesch, 1996). Some were mobile mercenaries participating in interregional conflicts (cf. for a wide selection of ancient sources: Tomaschitz, 1994; cf. for strontium isotope analysis from Kutná Hora: Scheeres, 2014, 99), whereas others stayed and consequently often show no signs of past combat related injuries (Ramsl, 2020a, 23-24). Thus, indicating that such 'stay at home warriors' likely in many cases did not participate in wars and maybe even had other primary occupations and intersecting identities. Female weapon burials, as a result, must also organise themselves within this spectrum of possibilities.

This range of possibilities is best exemplified by grave 37 and her three distinctive, processed, but fragmented red deer objects. Even though they remain unidentifiable, at least two plausible interpretations of the object's meaning and consequently of the female individual's personal identity are somewhat feasible. There is, for one, a straightforward connection since the most obvious way to obtain deer antler is hunting deer (Hrnčiarik, 2019, 449). This correlation could indicate that these antler objects simply emphasized her competence and/or passion for hunting. Another interpretation that has already been briefly discussed in correlation with comparable objects from the Dürrnberg 'Nordgruppe' graves 321 and 322 (cf. 9.5.1.; Zeller, 2003, 536-539), would see these antler objects as surgeon's or at least medical tools and puts this individual potentially even in a role similar to a

[32] Cf. fn. 16.

[33] As Ramsl (2020a, 168) pointed out, the situation of the differing gender identity marker would not change significantly if the spearhead belonged to adolescent individual directly below. Just as for the upper adolescent no sex has been determined for this individual, but instead of two bracelets this adolescent is wearing a bronze necklace, which is another customary female-related funeral item.

medicine woman, druid, or shaman (cf. on the correlation of deer antler and sacral contexts at the La Téne Roseldorf sanctuary in: Holzer, 2009).

If this interpretation is pursued further, a comparison with a comparable occupational identity is maybe more sensible, rather than searching strictly for a gender related comparison. Aside from Dürrnberg graves, a geographically significantly closer analogy would be grave 520 from Pottenbrunn (Ramsl, 2002, 43-45). The primary argument for this comparison, is the interpretation of this male individual by Ramsl (2002, 143-144) as an elite member and proto-druid. His evaluation was primarily based on two multifunctional iron objects interpreted as medical or surgeon's tools, an additional propeller-like bone object of unknown purpose (Ramsl, 2002, 142), and further analogies with similar burial good compositions in Malé Kosihy (Bujna, 1995, 90, tables 46-47) and München-Obermenzing (Krämer, 1985, tabel 59). It is also noteworthy that grave 520 is the only burial in Pottenbrunn with red-deer remains (Ramsl, 2002, 334).

This adult male of course is not entirely comparable as for his gender and since this burial is dated to LT B2. However, as much as his gender identity probably deviates, an analogy to his and grave 37's intersecting occupational and class identity may share a few noteworthy trades. Aside from those hard to interpret objects and the presence of red deer remains, both graves share an especially for grave 37 surprising focus on weapons. While 520 had a complete weapon set of a sword, lance, shield and arrows (Ramsl, 2002, 141), grave 37 still had her double javelins and the disturbance in the hip area that maybe hint towards a sword. Both burials also share a similar box belt plague. Either burial have a knife with a disc-shaped handle, something they have also in common with grave 453 from Malé Kosihy (Bujna, 1995, 90, tables 46-47). Although in case of grave 520, these are actually two on top of each other with a slightly bend handle. This knife type has often been identified as shaving knifes (cf. Neugebauer, 1992, 84). This would render grave 37s similar knife as a further atypical gender related objects or questions this objects interpretation. In any case, this analogy at the very least illustrates that any two burials with potentially correlating intersecting class, religious and occupational identities but different gender identities may be more appropriate for comparisons than the strictly comparing burials on basis of their gender.

To return to the main argument, the three Oberndorf burials share additional specific attributes but contrast in others aside from their considered sex and relation to weapons. Some differences do suggest different emphasised identity intersections, and consequently different motivations for the presence of these weapons. Grave 37 and grave 102 are both burials of middle adults of subgroup 3, are buried in a circular surrounding, were severely robbed and disturbed, but still contain a large quantity of items. Whereas 37 had two javelin heads as burials goods, 102 had no further indications for a potential warrior aside of the '*Koppelringe'*. Contrary to this, are her burials prominent spatial

position next to a large, predating structure (cf. 13.1.2), and the remaining burial goods indicator for her elite status. Unlike grave 37, but similarly to the adolescent of grave 18 is grave 102's gender identity portrayed by two bronze rings on each of her arms. Grave 37's, although the most excessively disturbed and looted burial of the three, shares this focus on status, particularly regarding the remaining burial goods. As discussed, her three additional antler objects could indicate a ritualistically themed occupational identity and renders this burials potentially comparable to the male individual in grave 520 from Pottenbrunn (Ramsl, 2002, 43-45). The lack of any indicators for a gender identity, can be argued on the grave robbing that particularly targeted the whole upper body area. The adolescent of the quadruple grave 28 is part of the rich 'commoner' group 5. This individual differs to the other two graves in regard of their burial ritual and age. If this individual's gender was considered to be female, this would have been portrayed by the dual bronze bracelets, much like grave 102. A parallel to grave 37, however, could be indicated by this this grave's, already discussed (cf. 12.1.3.2) odd ritualistic positioning of the lower two individuals' skulls. Regardless of any intangible actual religious identities, this may indicate a similar additional ritualistic/religious reasoning for the javelin head as potentially for grave 37.

To expand the scope of this evaluation, the previously mentioned three likely female-related weapon burials from the regionally correlated cemeteries of Mannersdorf (Ramsl, 2011, 75, fn. 9; tables 135-141), Chotín (Ratimorská, 1981, table 19: A) [34], and Kamenín, (Benadik, Vlček and Ambros, 1957, 100-101) should be utilized for additional comparisons. The Mannersdorf individual likely dating into LT B2 (Ramsl, 2011, 206), shares aspects with graves 102 and 37. This female was also a middle adult and also was buried within a circular surrounding structure (Ramsl, 2011, 17, fig. 5 and 29). There are however significant differences, as her burial good composition shows primarily an iron and weapon focused set, consisting of, i.a., remnants of a shield, a laurel leaf-shaped spearhead, a sword, as well as an iron pendant, knife, scissors, but only one bronze fingering and one bronze arm ring (Ramsl, 2011, 75). This would not only represent a female burial without any traditional female gender marker, but rather a warrior identity, due to a strong emphasis on weapons and iron much like many portrayed male warriors and/or class identities, as in subgroup 2.1 (cf. 12.1.2.2, diagram, 152). This stands in contrast to grave 102 and grave 28's upper adolescents.

Another burial with such a cross gender object combination is Kamenín's grave 3 (Benadik, Vlček and Ambros, 1957, 100-101). This grave even has the combination of two bracelets and two anklets, characteristic for female burials in Mannersdorf (cf. Ramsl, 2011, 246), but with a javelin head at her right side (Benadik, Vlček and Ambros, 1957, 100-101; Ramsl, 2020a, 168, fig. 23). However, this burial

[34] Cf. fn. 24.

was not buried within a surrounding structure (Benadik, Vlček and Ambros, 1957, 100, fig. 30), much like the adolescent of grave 28 but without any visible emphasis on a religious identity. Lastly, the Chotín burial, which portrays a young adult female individual buried with a sword and its scabbard, a spearhead, and an iron weapon belt (Ramsl, 2020a, 167). Even though we miss other specific details, such as whether or not the person was buried within a surrounding structure (Repka, 2020, 128 and 130, table 1), it seems to simultaneously share and diverge specific aspects with all above mentioned burial contexts.

In conclusion, within this admittedly still small sample size, the argument can be made that these portrayed females or cross-gender weapon-related burials present at least three different intersecting group identity variations with the following suggested motivations.

(1) Burials within surroundings, in which weapons are primarily an additional portrayed 'social capital' of a females' high elite status. Such could be argued for grave 102.
(2) Burials in which weapons are a direct indicator for a female warrior identity that mirrors their male equivalent. For this there could be two or three further variations:
    a. Elite burials within surroundings, such as the first group, but without any female identity indicator, like the double bracelets or anklets. The prime example for this case would be the Mannersdorf grave. Much like 102 and 37 the latter portrays at least a middle adult.
    b. A younger, potentially, 'middle' class variation of the above, such as Chotín's grave 30. Although there is no information relating to whether this individual was buried within a surrounding structure, this burial shares a warrior like burial good composition with her male counterparts and also suggests a portrayed social class similar to at least subgroup 3.2.
    c. A variation of the above 'middle class', that also has female identity marker aside of a single weapon. Such individuals potentially were female variants of the above stated, local warrior groups, that lacked signs of actual combat injuries and likely had other additional occupations. This could be the case for the upper adolescent of grave 18 as well as for the Kamenín grave.
(3) Burials in which weapons are potentially primarily part of a burial good set that represent another, complementary or superimposed occupational identity. Including such that have an additional religious/spiritual group identity intersection, as has been suggested for graves 37 and potentially also the upper adolescent of grave 18.

These proposed distinct identity intersections for female weapon burials are, of course, only interpretations and are in any case very likely interchangeable. The primary purpose of this analysis

was to present how overlapping group identities should be considered for any interpretation of an individual's or a group's identity. It should also highlight that for several of these individuals, their gender seemingly was not the primary identity their community intended to present them with. This example, as well as the spindle whorl group, and the normative portrayal of the younger subgroup 3.1 contrasted by several young individuals outside of other cluster groups, suggest that local traditional La Tène gender and age identities have been likely superimposed by the individual's social rank.

13 Conclusion

This thesis aimed to identify how well-suited clustering techniques are regarding research on Early Iron Age group identities and their inherent social composition. The analysis is based on a limited number of 87 burial contexts stemming from three separate contemporary neighbouring cemeteries.

The central research questions were as follows:

1. To what extent can clustering procedures, as applied in preceding studies (Popa, 2018) on a regional scope, also be utilised on smaller sets of burial data from cemeteries that have not been fully excavated?
2. If so, to what extent can these quantitative modelling techniques contribute to the existing research of Iron Age group identities, their complex intersections, and social structures?

The cluster analyses of the Traisen Valley Late Iron Age cemetery sites of Oberndorf, Ossarn, and Inzersdorf have produced eight cluster groups (cf. 11.3.1), based on a cumulative clustering of the entire data set. These groups have been computed by a similarity algorithm (cf. 10.2), primarily on the basis of communalities and differences in burial rites, the number of objects and object materials, as well as burial good categories premised on functionality and typology (cf. 9.4). To answer the first research question, this methodology was additionally applied to each individual cemetery data set. By comparing the resulting individual cemetery cluster with the cumulative one, the applicability, depending on each specific site's number of burials, could be assessed independently.

The quantitative results, on their own, reflect predominantly similarities and differences in how each community consciously portrayed their burial practices in terms of ritual, efforts, and quantitative and qualitative 'social' and 'economic capital'. This base interpretation was further augmented by cross analysing the final eight cluster groups with non-quantifiable aspects, such as each burial's anatomical sex or age, a GIS based spatial analysis of each cemetery, by contextualising it with related archaeological contexts and a holistically established theoretical body on identity. One essential theoretical aspect of the interpretation emphasises the inherent relativity of identity between agency and structure. Underscoring that even the most plausible interpretation of identities or social

hierarchies, consequently, remains a comparative and likely even contemporaneously contested possibility within a spectrum. However, quantitative methods offer different means of reducing the range within this spectrum, thus providing an anticipated answer to the second research question.

13.1 Applicability of Comparative Cluster Analysis on Limited Burial Data

The results have shown that the resolution of burial data is as essential as its sheer volume. Notwithstanding that a large number of data points is generally preferred for any quantitative modelling procedure, the thoroughly documented and processed state of the received burial data provided an invaluable high-dimensional attribute space. The validity of the individual cemetery clusters nevertheless varied considerably. The clustering of the 47 Oberndorf graves could be substantiated based on the cumulative clustering results and would have allowed a proper analysis on its own. The reason for this is not only the higher volume of burial data but also the extent and state of the excavated area, which allowed for a sufficient spatial analysis. The Ossarn data set of 27 graves, even though validated when compared to the cumulative results, would not have provided enough details and variability to be analysed in isolation. Finally, the 13 Inzersdorf burial data sets proved insufficient to provide distinct and comparable cluster groups on their own.

Consequently, the threshold number of data sets for a contextually plausible clustering and their interpretation depended primarily on the quantity and quality of any additional documented details for each burial. This emphasises the significance of exact and dependable field documentation and subsequent scientific evaluation for acquiring processable data prior to similar quantitative approaches. Considering that the quality of the data received was mostly consistent for all three cemeteries, the threshold for applicability for this analysis settled in the range of the Ossarn data set, of approx. 25 to 35 graves. As a result, the clustering procedures utilised in this thesis are potentially valid for lower burial data volumes derived from partially excavated cemeteries. Its applicability, however, is heavily dependent on the quality and resolution of the analysed data, as well as the detail of the excavation record. Since the cumulative clustering provided a significantly higher informative value, it must be determined that any interpretation profoundly benefits if multiple clustered burial data from smaller and incomplete cemetery sites are jointly and comparatively analysed.

13.2 Results and Methodological Advantages for Cluster Interpretation

The final analysis translated the eight cluster groups as approx. representations of three to four base social classes. These social strata have been interpreted as a potential local core family that was buried within surrounding structures, a variety of different individuals that make up their direct retinue, as well as additional commoners. The elite group itself has been further differentiated by the algorithm based, i.a., their portrayed ‘social’ or ‘economic capital’. One being an actual core elite, of which three out of ten were women, and a less richly furnished but still less contemporaneously looted ’satellite

elite' consisting almost entirely of male adults with basic weaponry. Among the suggested retinue burials are a specific group whose graves portray a conspicuously greater emphasis on 'social' and 'economic capital' than the above stated 'satellite elite'. In Oberndorf, the majority of these graves was spatially staged in double rows, intermixed with other 'commoner' burials, in relation to specific surrounding structures. Additionally, a number of these graves presented elaborately buried, rare outlier inhumations and cremations, within the dataset as well as in related cemeteries.

This arguably suggests that some of these were mobile agents and attached specialists of varying occupational identities, that may present the more economically successful core elite retinue members. The largest social group consists of a possible mixture of further retinue members, or other commoners. This group of which the majority were of young age, generally have been portrayed relatively normative. Finally, two further groups, that comprise of a small grouping of burials with almost no burial goods that may present a mixture of the lowest social strata or lower class child burials and a small group of cremations that allowed no further evaluation on their identity.

Additionally, to these suggested local social groups, two further observations have been suggested considering the social hierarchy and intersecting group identity power relations:

(1) A statistically evident relatively flat, local social hierarchy, aside of the elaborate burial structures of the core elite.
(2) An apparent intersection of class, gender, age, and occupational identities, whereas class appears to be superimposed in relation to potential power dynamics. This predominance of class identities is particularly noticeable for female gender and age identities.

The application of cluster analysis for research on group identities and social structures presents, first and foremost, an additional scientific tool that provides multiple methodological benefits. On their own, neither quantitative nor traditional, often mainly heuristic, archaeological methodologies are capable of conveying a complex, inherently political, and personal subject as past group identities with sufficient accuracy. However, the chief advantage and limitation of clustering methods is exactly that the interpretation of any resulting cluster remains purely empiric. Even though they are explicitly designed to be independent of conventional classifications, they must still be evaluated using established archaeological standards. In combination, quantitative modelling assists in managing complexity and uncertainty, while established matching theoretical bodies and contextualization allow for a plausible interpretation. Additionally, any statistical methodologies provide a considerable number of validation processes to reduce any unintended research bias or unwanted layers of subjectivity. As a result of this, as well as its adaptability, clustering analysis presents an effective tool for any examination of pre- and protohistoric group identities.

14 Fazit (Deutsch)

Ziel dieser Arbeit war es herauszufinden, inwieweit sich Clusteranalysen für die Erforschung früheisenzeitlicher Gruppenidentitäten und deren inhärente soziale Zusammensetzung eignen. Die Analyse basiert auf einer begrenzten Anzahl von 87 Grabkontexten, die aus drei separaten, benachbarten Gräberfeldern stammen.

Die zentralen Forschungsfragen lauteten wie folgt:

(1) Inwieweit lassen sich Clusteranalysen, wie sie in vorangegangenen Studien (Popa, 2018) auf regionaler Ebene angewandt wurden, auch auf kleinere Bestattungsdatensätze aus nicht vollständig ausgegrabenen Friedhöfen anwenden.
(2) Wenn ja, inwieweit können diese quantitativen Modellierungsverfahren einen Beitrag zur Erforschung eisenzeitlicher Gruppenidentitäten, ihrer komplexen Verflechtungen und sozialer Strukturen leisten.

Die Clusteranalysen der späteisenzeitlichen Gräberfelder von Oberndorf, Ossarn und Inzersdorf im Traisental ergaben acht Clustergruppen (vgl. 11.3.1), die auf einem kumulativen Clustering des gesamten Datensatzes beruhen. Diese Gruppen wurden mittels eines Ähnlichkeitsalgorithmus (vgl. 10.2) vor allem auf der Basis von Gemeinsamkeiten und Unterschieden in den Bestattungsriten, der Anzahl der Objekte und Objektmaterialien sowie funktional und typologisch begründeten Beigaben Kategorien berechnet (vgl. 9.4). Zur Beantwortung der ersten Forschungsfrage wurde diese Methodik zusätzlich auf jeden einzelnen Friedhofsdatensatz angewendet. Durch den Vergleich des sich ergebenden individuellen Friedhofscluster mit den kumulativen Clustern konnte die Anwendbarkeit in Abhängigkeit von der Anzahl der Bestattungen des jeweiligen Ortes unabhängig beurteilt werden.

Die quantitativen Resultate für sich spiegeln in erster Linie Ähnlichkeiten und Unterschiede wider, in der Art und Weise wie die einzelnen Gemeinschaften ihre Bestattungspraktiken in Bezug auf Rituale, Aufwand sowie quantitatives und qualitatives "soziales" und "wirtschaftliches Kapital" bewusst darstellten. Diese Basisinterpretation wurde ergänzt durch eine Kreuzanalyse der finalen acht Clustergruppen mit nicht quantifizierbaren Aspekten, wie dem anatomischen Geschlecht oder Alter jeder Bestattung, einer GIS-basierten räumlichen Analyse jedes Friedhofs, sowie durch die Kontextualisierung mit verwandten archäologischen Kontexten und einem holistisch etablierten theoretischen Korpus zum Thema Identität. Einer der wesentlichen theoretischen Aspekte für die Interpretation unterstreicht die inhärente Relativität von Identität zwischen Individuum und Struktur. Dies zeigt deutlich, dass selbst die plausibelste Interpretation von Identitäten oder sozialen Hierarchien stets vergleichende und wahrscheinlich sogar zeitgenössisch umstrittene Möglichkeiten innerhalb eines Spektrums bleiben. Quantitative Methoden bieten jedoch verschiedene Möglichkeiten, die Bandbreite innerhalb dieses Spektrums zu reduzieren.

14.1 Anwendbarkeit der vergleichenden Clusteranalyse auf begrenzte Bestattungsdaten

Die Ergebnisse haben gezeigt, dass die Auflösung der Bestattungsdaten ebenso wichtig ist wie ihr Umfang. Ungeachtet der Tatsache, dass eine große Anzahl von Datenpunkten im Allgemeinen für jedes quantitative Modellierungsverfahren bevorzugt wird, lieferte der sorgfältig dokumentierte und aufbereitete Zustand der erhaltenen Bestattungsdaten einen unschätzbaren hochdimensionalen Attributraum. Die Aussagekraft der einzelnen Friedhofscluster war jedoch unterschiedlich. Die Clusteranalyse der 47 Oberndorf Gräber ließ sich anhand der kumulativen Clusterergebnisse bestätigen und hätte auch für sich allein eine sachgerechte Analyse ermöglicht. Der Grund hierfür liegt nicht nur in der größeren Menge an Bestattungsdaten, sondern auch in der Ausdehnung und Beschaffenheit der Grabungsfläche, die eine ausreichende räumliche Analyse ermöglichte. Der Ossarn-Datensatz von 27 Gräbern lieferte nicht genügend Details und Variabilität, um isoliert analysiert werden zu können, auch wenn er durch das kumulative Ergebnis größtenteils validiert werden konnte. Die 13 Inzersdorfer Bestattungsdatensätze erwiesen sich als unzureichend, um für sich genommen eindeutige und vergleichbare Gruppen zu bilden.

Die Schwellenzahl der Datensätze für eine kontextuell plausible Clusterbildung und deren Interpretation hing in erster Linie von der Quantität und Qualität der zusätzlich dokumentierten Details zu jeder Bestattung ab. Dies unterstreicht die Bedeutung einer exakten und verlässlichen Felddokumentation und einer anschließenden wissenschaftlichen Auswertung für die Gewinnung verwertbarer Daten vor ähnlichen quantitativen Methodiken. In Anbetracht der Tatsache, dass die Qualität der erhaltenen Daten für alle drei Friedhöfe weitgehend einheitlich war, lag die Schwelle für die Anwendbarkeit dieser Analyse im Bereich des Ossarn-Datensatzes von ca. 25 bis 35 Gräbern. Folglich sind die in dieser Arbeit verwendeten Clustering-Verfahren potenziell auch für geringere Bestattungsdatenmengen aus nur abschnittweise ausgegrabenen Friedhöfen geeignet. Ihre Anwendbarkeit hängt jedoch essenziell von der Qualität und Auflösung der analysierten Daten sowie von der Detailliertheit des Grabungsdokumentation ab. Da das kumulative Clustering eine deutlich höhere Aussagekraft lieferte, muss festgestellt werden, dass eine Interpretation wesentlich davon profitiert, wenn mehrere geclusterte Bestattungsdaten aus kleineren und unvollständigen Gräberfeldern gemeinsam und vergleichend ausgewertet werden.

14.2 Ergebnisse und methodische Vorteile der Clusterinterpretation

In der abschließenden Analyse wurden die acht Clustergruppen als annähernde Repräsentationen von drei bis vier sozialen Basisschichten übersetzt. Diese sozialen Schichten wurden als eine mögliche lokale Kernfamilie interpretiert, die in Umhegungen bestattet wurden, eine Vielzahl verschiedener Individuen, die ihr direktes Gefolge bildeten, sowie zusätzliche „Gemeine“. Die Elitegruppe selbst wurde durch den Algorithmus weiter differenziert, u. a. anhand ihres dargestellten "sozialen" oder

"wirtschaftlichen Kapitals". Dabei handelt es sich um eine eigentliche Kernelite, von der drei von zehn Frauen waren, sowie eine weniger reich ausgestattete, aber in einem deutlich geringeren Ausmaß zeitgenössisch beraubte "Satellitenelite", die fast ausschließlich aus männlichen Erwachsenen mit einfacher Bewaffnung bestand. Unter den vorgeschlagenen Gefolgschaftsbestattungen befindet sich eine besondere Gruppe, deren Gräber eine auffallend stärkere Betonung von "sozialem" und "wirtschaftlichem Kapital" zeigen als die eben genannte "Satellitenelite". In Oberndorf wurde die Mehrzahl dieser Gräber in Doppelreihen, vermischt mit anderen "Gemeinen" Bestattungen, in Bezug auf bestimmte Umhegungsstrukturen räumlich inszeniert. Darüber hinaus stellen einige Körper- und Brandbestattungen dieses potenziellen Gefolges Sonderbestattung dar, sowohl innerhalb der untersuchten Gräberfelder als auch in regionalen benachbarten Friedhöfen.

Dies deutet darauf hin, dass es sich bei einigen von ihnen um von der Elite abhängige Spezialisten, mit höherer Mobilität und mit unterschiedlichen beruflichen Identitäten handelte, die möglicherweise die wirtschaftlich erfolgreicheren Mitglieder der Gefolgschaft der Kernelite darstellten. Die größte soziale Gruppe besteht aus einer möglichen Mischung aus weiteren Gefolgsleuten oder anderen „Gemeinen“. Diese mehrheitlich jugendliche Gruppe, wurde im Allgemeinen von ihrer Gemeinschaft normativ dargestellt. Schließlich zwei weitere Gruppen, welche aus einer kleinen Gruppe von fast beigabenlosen Bestattungen, die möglicherweise eine Mischung aus den untersten sozialen Schichten oder Kinderbestattungen der Unterschicht darstellen, und eine kleine Gruppe von Brandbestattungen, die keine weitere Aussage über ihre Identität zulassen.

Zusätzlich zu diesen vorgeschlagenen lokalen sozialen Gruppen wurden zwei weitere Beobachtungen gemacht, die die soziale Hierarchie und die sich überschneidenden Machtbeziehungen zwischen den Gruppenidentitäten berücksichtigen:

(1) Eine, abgesehen von den aufwendigen Umhegungen der Kernelite, statistisch nachweisbare, relativ flache, lokale soziale Hierarchie.
(2) Eine sichtbare Überschneidung von Klassen-, Geschlechts-, Alters- und Berufsidentitäten, wobei die Klasse in Bezug auf die potenzielle Machtdynamik überlagernd zu sein scheint. Dieses Übergewicht von Klassenidentitäten ist besonders bei weiblichen Geschlechts- und Altersidentitäten zu beobachten.

Die Anwendung der Clusteranalyse für die Erforschung von Gruppenidentitäten und Sozialstrukturen stellt in erster Linie ein zusätzliches wissenschaftliches Instrument dar, das mehrere methodische Vorteile bietet. Weder quantitative noch traditionelle, oft hauptsächlich heuristische archäologische Methoden sind für sich genommen in der Lage, ein komplexes, inhärent politisches und persönliches Thema wie vergangene Gruppenidentitäten mit ausreichender Genauigkeit zu erfassen. Der größte Vorteil und zugleich die größte Einschränkung von Clustermethoden besteht jedoch gerade darin, dass

die Interpretation eines jeden resultierenden Clusters rein empirisch bleibt. Auch wenn sie ausdrücklich unabhängig von konventionellen Klassifizierungen konstruiert sind, müssen sie dennoch nach etablierten archäologischen Standards bewertet werden. In Kombination hilft die quantitative Modellierung, Komplexität und Unsicherheit zu bewältigen, während etablierte theoretische Modelle und weitere Kontextualisierung eine plausible Interpretation ermöglichen. Darüber hinaus bieten alle statistischen Methoden eine beträchtliche Anzahl von Validierungsprozessen, um unbeabsichtigte Forschungsverzerrungen oder unerwünschte Subjektivitätsebenen zu reduzieren. Aus diesem Grund und dank ihrer Anpassungsfähigkeit stellt die Clusteranalyse ein wirksames Instrument für die Untersuchung von ur- und frühgeschichtlichen Gruppenidentitäten dar.

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Appendix

Similarity Algorithm

Simon Braito, BSc.

The similarity algorithm computes a distance matrix which can subsequently be used to run various clustering algorithms. Input to this algorithm is a data set consisting of records derived from graves explored in this thesis. Each record in this data set consists of variables modeling ritual related grave attributes as well as a data set of objects present in the grave.
The computed distance matrix consists of all pairwise distances between the graves provided in the input. For each grave in the input a row and a column is added to the distance matrix. Each cell in the matrix gives the distance between the graphs corresponding to the cells row and column numbers. Since the distances between two identical graves is 0, each cell in the diagonal is 0. Internally, this distance matrix is computed by first constructing a matrix of pairwise grave similarities and later converting these similarities to distances.
To arrive at the similarity matrix, an intermediate similarity matrix based on ritual information is combined with another intermediate similarity matrix based on object information.

To provide a more detailed view of the algorithm, here we first discuss how ritual based similarity as well as object based similarity between two graves is computed. Next, we show how to combine the two intermediate similarity matrices constructed from pairwise ritual based and object based grave similarities to arrive at the final similarity matrix. Last, we show how the similarity matrix is transformed to a distance matrix.

Ritual Based Similarity

For the ritual based similarity, variables `grave type`, `ritual type` and `multiple burial` are utilized. Each variable is augmented with a predefined weight. The ritual based similarity between two graves is computed by aggregating weights for variables, where the value held in both graves is identical. This sum is then scaled to give a score in the range $[0, 1]$. Weights provide a way to bias the algorithm to emphasize certain attributes. They are assigned on an empirical basis. For example, one could emphasize variable `grave type` by weighting it with a value of 1 while weighting the remaining two variables with *0.5*. Two graves that only have variable `grave type` in common will yield the same similarity score as two graves sharing the remaining two variables.

More formally, let's denote the ritual based similarity matrix R and denote its elements R_{ij}, where row number i and column number j correspond to the ith and jth grave respectively. Now let $g(i)$, $r(i)$ and $b(i)$ be the values of the variables `grave type`, `ritual type` and `multiple burial` taken by some grave i. Furthermore, let

$$\delta_g(i,j) := \begin{cases} 1 & \text{if } g(i) = g(j) \\ 0 & \text{else} \end{cases} ,$$

$$\delta_r(i,j) := \begin{cases} 1 & \text{if } r(i) = r(j) \\ 0 & \text{else} \end{cases} \quad \text{and}$$

$$\delta_b(i,j) := \begin{cases} 1 & \text{if } b(i) = b(j) \\ 0 & \text{else} \end{cases}$$

be functions that yields the value 1 if graves i and j have the same value for variables `grave type`, `ritual type` and `multiple burial` respectively and 0 otherwise. The element of the ritual based similarity matrix $R_{i,j}$ is then computed by the weighted average

$$R_{i,j} = \frac{w_g \delta_g(i,j) \ + \ w_r \delta_r(i,j) \ + \ w_b \delta_b(i,j)}{w_g + w_r + w_b} ,$$

where w_g, w_r and w_b denote the previously described variable weights.

In addition to assigning variable weights, one is also able to assign weights to individual values a variable can take. This can be used to increase or decrease emphasis on particular variable values. When two graves hold the same value for a particular variable, this weight is added to the variable weight. The sum of variable weight and variable value weight cannot be negative, hence the minimum for variable value weight is the negative value of its corresponding variable weight. For instance, if variable `grave type` is weighted with 1 and value `flat` was assigned a weight of 0.5, a total weight of 1.5 is awarded for two graves matching this exact value. Finally, to arrive at a scaled similarity score, which by definition has to be a number in the range $[0, 1]$, we need to divide the summed up weights for two graves by the maximum obtainable sum of weights of all variables.

In more formal terms, let $w^g(i)$, $w^r(i)$ and $w^b(i)$ be the weight of the `grave type`, `ritual type` and `multiple burial` value for grave i. The total weight for variables including the corresponding variable weights for two graves i and j can be expressed by

$$w^g_{total}(i,j) := w_g + \max\left(w^g(i), w^g(j)\right),$$

$$w^r_{total}(i,j) := w_r + \max\left(w^r(i), w^r(j)\right) \text{ and}$$

$$w^b_{total}(i,j) := w_b + \max\left(w^b(i), w^b(j)\right).$$

Incorporating these total weight into the ritual based similarity, we arrive at

$$R_{i,j} = \frac{w^g_{total}(i,j)\ \delta_g(i,j)\ +\ w^r_{total}(i,j)\ \delta_r(i,j)\ +\ w^b_{total}(i,j)\ \delta_b(i,j)}{w^g_{total}(i,j)\ + w^r_{total}(i,j)\ + w^b_{total}(i,j)}\ .$$

To give a more concise formulation one can further rewrite this to

$$R_{i,j} = \frac{\sum_{v \in V} w^v_{total}(i,j)\ \delta_v(i,j)}{\sum_{v \in V} w^v_{total}(i,j)}\ ,$$

where $V = \{g, r, b\}$ is the set of variables to consider.

As an example, consider the same variable weights as in the previous example, where variables `grave type` is weighted 1 and variables `ritual type` and `multiple burial` are assigned a weight of 0.5. Furthermore, let variable value `unknwon` of variable `grave type` be weighted by -1 (the minimum weight a value for variable `grave type` can be assigned), No other variable value weights are assigned, hence these weights default to 0. If two graves are identical in variable `grave type` with a `grave type` value of *flat* the weights sum up to $1 + 0 = 1$ since the variable weight of `grave type` is set to 1 and the weight of its variable value *flat* is 0 by default. To find the divisor, we sum up the maximum possible weights. Since, all variable value weights are 0 or negative, the maximum weight of all variables is the variable weights themselves summing up to $1 + 0.5 + 0.5 = 2$. Hence, for the graves in this example we arrive at a similarity score of $\frac{1}{2} = 0.5$.
Now let's consider two graves that are again identical in variable `grave type` but with variable value `unknwon`. In this case the weight for variable `grave type` sums up to $1 + -1 = 0$ giving an overall variable weight sum of 0 and a similarity score of $\frac{0}{2} = 0$. Hence, the graves are computed to be completely distinct.
For a final example, let's additionally set the weight for variable value `cremation` of variable `ritual type` to 1.5. Now consider two graves that both have `grave type` `tumuli`, `ritual type` `cremation` and different values for `multiple burial`. Calculating the total variable weights for the two considered graves we get $1 + 0 = 1$ for variable `grave type`, $0.5 + 1.5 = 2$ for variable `ritual type` and 0 for variable *multiple burials* since the graves differ in this variable. Next, we need to calculate the scaling factor. We thus sum up the maximum total weights possible for the two graves, giving 2, 1 and 1 for variables `grave type`, `ritual type`, `multiple burial` and their respective variable values. This gives a similarity score of $\frac{2}{4} = 0.5$.

Note that in [Popa2018] variable value weights were only used for computing object based similarities. However, it was mentioned that the algorithm used in [Popa2018] provided the possibility to utilize variable value weights for ritual based similarity as well.
Furthermore, in [Popa2018], the sum of variable weight and variable value weight is limited to be strictly positive, as opposed to non-negative (i.e. including 0) which is the case here. As shown in the example above, this makes it possible to

cancel out a variables weight contribution. By means of this modification, one can thus achieve the same effect as explicitly defining that for certain variable values (e.g. `unknwon`) a match should be discarded. Finally, for sake of usability, ranges for variable weights were restricted by the GUI to be in the range $0, 1$. Variable value weighs were limited to a minimum value of the negative of the corresponding variable weight and a maximum value of 10. This provided enough flexibility to configure practicably reasonable weight distributions.

Object Based Similarity

To calculate the object based similarity between two graves, first, a matrix of similarities between objects present in the graves is constructed. Each object in one grave is compared to each object in the other grave. From this matrix, the object based similarity score for two graves is derived by means of a maximum matching algorithm.

Similarity Between Objects

Similar to the ritual based similarity score, the similarity score between objects is based on multiple weighted variables and variable values. The variables utilized for comparing objects for this thesis are `Category1`, `Category2`, `Category3`, `Category4`, `Material` and `Decorated`. Here, variable `Decorated` was added to the original similarity algorithm in [Popa2018]. As a first step in calculating the object based similarity between two graves, the unscaled similarity (i.e. the sum of all variable and variable value weights) between all objects of the first and the second grave is calculated. Analogous to the dividend of the ritual based similarity between two graves, for two objects k and l this sum can be expressed as

$$O_{kl} = \sum_{v \in V} w^v_{total}(k, l)\ \delta_v(k, l)\ ,$$

where the set of variables $V = \{c_1, c_2, c_3.c_4, m, d\}$ consists of `Category1`, `Category2`, `Category3`, `Category4`, `Material` and `Decorated` respectively.

Based on this, given two graves with n and m objects respectively, one can then construct an unscaled object similarity matrix O of dimension $n \times m$. This matrix consists of unscaled object similarities O_{kl} where k and l refer to the kth element of the first and the lth object of the second grave respectively.

Aggregating Object Similarities

To calculate the object based similarity score between two graves, unscaled object similarities are summed up and scaled. Importantly however, the algorithm requires that, for this sum, any object can only be involved a maximum of one time. In other words, if the unscaled similarity of objects A and B is used for the sum, no other similarity score involving objects A or B can be used later on. In terms of the previously calculated matrix O, this means for computing this score, not more than one value per row/column can be used.

Additionally, the algorithm requires this sum to be the maximum sum possible under this restriction. Hence, one needs a strategy to determine the pairs of objects (i.e. elements of O) that yield the maximum sum of unscaled similarities. The problem of finding mutually exclusive matches of maximum value known as the maximum bipartite matching problem and is efficiently solvable with existing algorithms. For this thesis, the Hungarian maximum matching algorithm was used.

After the matching algorithm has determined the maximum object matches, the unscaled object similarities corresponding to these matches are summed up. To arrive at an object based similarity score, this sum is then scaled to be in the range $[0, 1]$. To do so, the maximum unscaled similarity of all objects in each grave is calculated. More specifically, for both graves individually, the maximum variable and variable value weights for each object are calculated and summed up. The larger value among both graves is then used as the scaling factor.
More formally, let O^{ij} be the unscaled object similarity matrix for the objects in graves i and j and let M^{ij} be the subset of elements of O^{ij} determined by the maximum matching algorithm. Furthermore, let's denote the sum of all variable and variable value weights for all objects in a grave i as

$$w_{obj}(i) := \sum_{k=1}^{n_i} \sum_{v \in V} w_v + w^v(i,k) \ ,$$

where n_i is the number of objects in grave i, $V = \{c_1, c_2, c_3.c_4, m, d\}$ is the set of all object variables to consider, w_v is the variable weight of object variable v and $w^v(i,k)$ is the variable value weight for the value of variable v taken by object k in grave i. The object based grave similarity between graves i and j is then given by

$$G_{ij} = \frac{\sum_{m \in M^{ij}} m}{\max(\ w_{obj}(i),\ w_{obj}(j)\ )} \ .$$

Note that in [Popa2018], to speed up computation, a non-exact, heuristic approach was used to determine maximum matchings. For this thesis this was not found to be necessary.

Computing the Distance Matrix

Calculating the ritual based/object based similarity scores for each pair of graves, one can construct a ritual based/object based similarity matrix. To compute a distance matrix either one of these matrices or a combination of both (see below) can be used. For the transformation of the similarity matrix into a distance matrix, two options are available. Each cell is transformed by either applying $1 - S_{ij}$ or $\sqrt{1 - S_{ij}}$, where i and j correspond to a cells row and column number respectively. The result for both transformations is a number in $[0, 1]$, where identical graves have distance 0 and distinct graves have distance 1. Note that the second transformation overall increases the distance between graves.

To combine ritual based and object based similarity matrices, a weighted average is used. More formally, the combined similarity scores between two graves i and j is given by

$$S_{ij} = \frac{R_{ij} + \alpha(i,j)\, G_{ij}}{\alpha(i,j) + 1} \ ,$$

where $\alpha(i,j)$ is a weighting factor dependent on the maximum number of objects present in the grave. In particular, with n_{max} denoting the maximum observed number of objects per grave, we define

$$\alpha(i,j) := \alpha_{min} + (\alpha_{max} - \alpha_{min})\, \frac{\max(n_i, n_j)}{n_{max}} \ ,$$

, where n_i and n_j are the number of objects in graves i and j respectively and $[\alpha_{min}, \alpha_{max}]$ is the configurable range of $\alpha(i,j)$. As with the weighting process, finding a suitable range $[\alpha_{min}, \alpha_{max}]$ is done purely on an empirical basis. For sake of usability, the GUI restricted the input of α_{min} and α_{max} such that $0 \leq \alpha_{min} \leq \alpha_{max} \leq 10$.
Note that in [Popa2018] it is only stated that α is dependent on the maximum number of objects present in the grave. However, the exact formulation was not stated hence we opted for a linear dependency.

Annex 1: Zuammenfassung Deutsch

Identities in a Period of Transition:

Theory and Statistical Modelling Case Studies at the early Iron Age cemeteries of Oberndorf in der Ebene, Ossarn and Inzersdorf.

Diese Masterarbeit besteht aus zwei Abschnitten: einer vertiefenden Ausarbeitung der Identitätstheorie und Gruppenidentitäten in Bestattungskontexten sowie vier Fallstudien zur Anwendung der Clusteranalyse auf drei benachbarte Gräberfelder der Früheisenzeit im Traisental. Die Datengrundlage umfasst 87 Bestattungen aus Oberndorf, Ossarn und Inzersdorf in der Übergangsphase zwischen Hallstatt und La Tène.

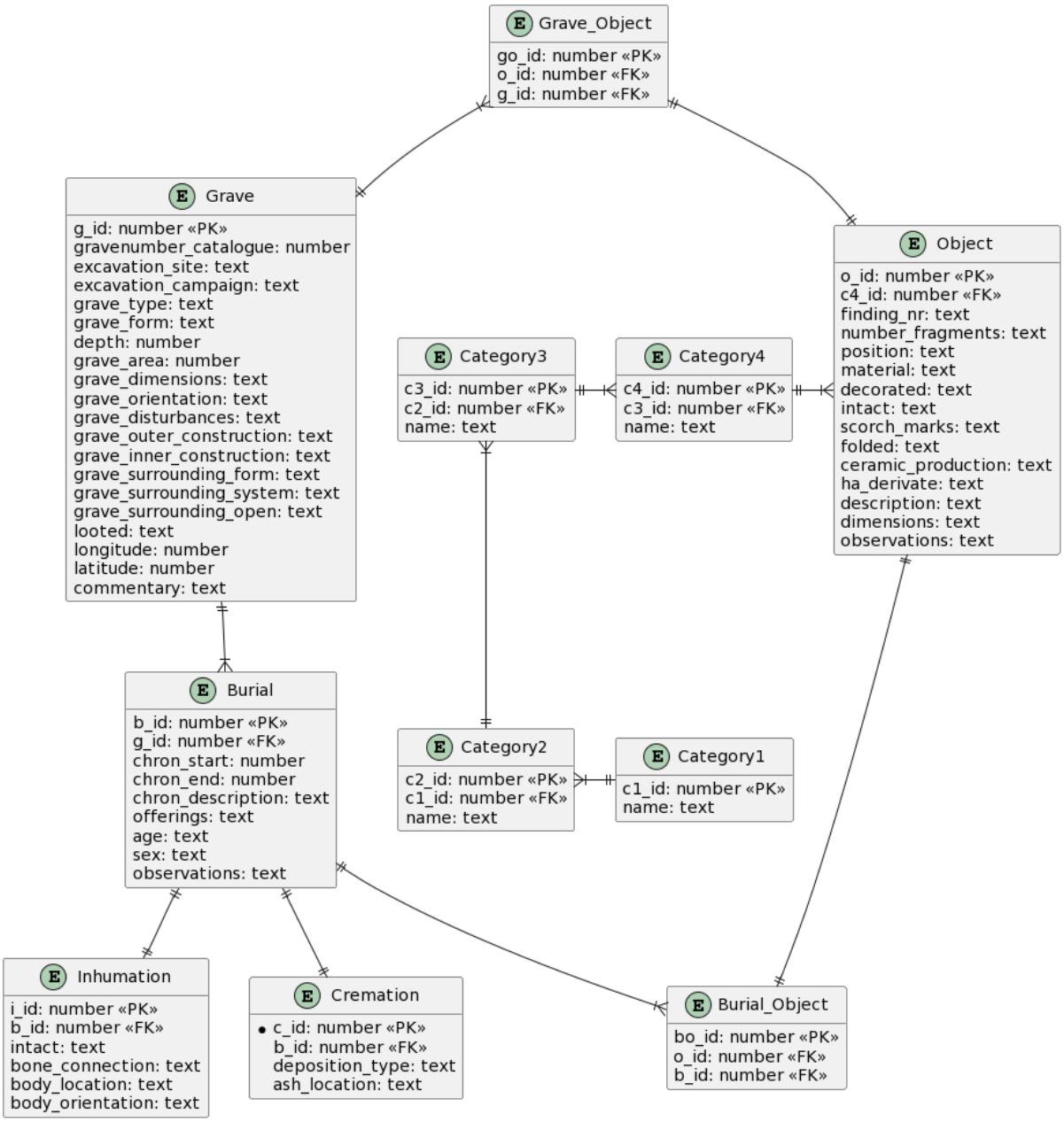
Das Hauptziel der Arbeit ist die Visualisierung von Gruppenidentitäten und die Evaluation der Anwendbarkeit der Clusteranalyse auf nicht vollständig ausgegrabene Gräberfelder. Dies erfolgt durch individuelle Clusteranalysen für jedes Gräberfeld und ein kumulatives viertes Clustering zur Validierung. Die Ergebnisse zeigen acht Clustergruppen, basierend auf Gemeinsamkeiten und Unterschieden in Bestattungsriten und Beigaben.

Die Forschungsfragen untersuchen die Eignung der Clusteranalyse auf kleinere Datensätze und deren Beitrag zur Erforschung sozialer Strukturen. Die quantitativen Resultate offenbaren Ähnlichkeiten und Unterschiede in den Bestattungspraktiken, während nicht quantifizierbare Aspekte wie Geschlecht und räumliche Analyse ergänzende Einsichten bieten. Die Arbeit betont die Relativität von Identität und zeigt, dass quantitative Methoden die Bandbreite dieser Identitätsinterpretationen reduzieren können.

Insgesamt verdeutlicht die Masterarbeit die Anwendbarkeit der Clusteranalyse auf die Erforschung früheisenzeitlicher Gruppenidentitäten und ihre sozialen Zusammensetzungen, wobei sie aufzeigt, wie quantitative Methoden zur weiteren Untersuchung dieser komplexen Thematik beitragen können.

Annex 2: Database Entity Relationship Diagram

Simon Braito, BSc. (2022)



Grave ID	Catalogue Nr.	Excavation Site	Year	Burial ID	Finding Nr.	Material	Decorated	Description	Category 1	Category 2	Category 3	Category 4
1	3	Oberndorf	1982	3	2	Iron	Unknown	Iron fragment	Unidentified object	unidentified object	unidentified object	unidentified object
1	3	Oberndorf	1982	3	3	Clay	Yes	Small bowl, with omphalos (omph.)	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl type Bw 2a
1	3	Oberndorf	1982	3	4	Iron	Unknown	Javelin head	Weapon	Offensive	Javelin	Javelin type 1
1	3	Oberndorf	1982	3	5	Iron	No	Javelin head	Weapon	Offensive	Javelin	Javelin type 2
1	3	Oberndorf	1982	3	6	Iron	No	Javelin head	Weapon	Offensive	Javelin	Javelin type 2
1	3	Oberndorf	1982	3	7	Iron	No	Knife	Tool	Cutting	Knife	Knife type 1
1	3	Oberndorf	1982	3	8	Iron	No	Koppelring	Weapon	Costume (w)	Belt	Koppelring
1	3	Oberndorf	1982	3	9	Iron	Yes	Belt hook	Weapon	Costume (w)	Belt	Belt hook type 1
1	3	Oberndorf	1982	3	10	Iron	No	Cuff	Other	Cuff	Cuff	Cuff
2	4	Oberndorf	1982	2	3	Bronze	Yes	Fibula, type alpine animal head	Adornment or clothing accessory	Costume	Fibula	Ost alpine Tierkopffibel
2	4	Oberndorf	1982	2	4	Clay	No	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 1
2	4	Oberndorf	1982	2	5	Iron	Unknown	Javelin head	Weapon	Offensive	Javelin	Javelin fragment
2	4	Oberndorf	1982	2	5	Iron	Unknown	Javelin head	Weapon	Offensive	Javelin	Javelin fragment
2	4	Oberndorf	1982	2	6a	Iron	Yes	Sheath	Weapon	Costume (w)	Sheath	Sheath type 1
2	4	Oberndorf	1982	2	6b	Iron	Yes	Fibula, type Certosa	Adornment or clothing accessory	Costume	Fibula	Certosa Fibula
2	4	Oberndorf	1982	2	7	Tooth	No	Animal teeth, maybe carnassial	Other	Animal teeth	Animal teeth	Animal teeth
3	5	Oberndorf	1982	4	2	Clay	Unknown	Potential urn	Other	Vessel	Lost vessel	Lost vessel
3	5	Oberndorf	1982	4	3a	Iron	No	Knife	Tool	Cutting	Knife	Knife type 2
3	5	Oberndorf	1982	4	3b	Iron	Unknown	Ring	Other	Ring finger sized ring	Ring	Iron ring
3	5	Oberndorf	1982	4	4	Iron	No	Knife	Tool	Cutting	Knife	Knife type 3
3	5	Oberndorf	1982	4	5a	Iron	Unknown	Awl or Awl like perforating tool	Tool	Perforating	Awl	Awl
3	5	Oberndorf	1982	4	5b	Iron	No	Box belt plaque	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
3	5	Oberndorf	1982	4	6	Iron	Unknown	Fibula needle	Adornment or clothing accessory	Costume	Fibula	Fibula needle
4	6	Oberndorf	1982	5	1	Iron	Yes	Fibula, type bird head	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
4	6	Oberndorf	1982	5	2	Iron	No	Iron ring	Other	Ring finger sized ring	Ring	Iron ring
4	6	Oberndorf	1982	5	3	Clay	Unknown	Vessel fragment, badly preserved	Other	Vessel	Ceramic fragment	Small ceramic fragment
5	9	Oberndorf	1982	6	2	Iron	No	Javelin head	Weapon	Offensive	Javelin	Javelin type 2
5	9	Oberndorf	1982	6	3	Bronze	Unknown	Needle like artifact, prop. from fibula	Adornment or clothing accessory	Costume	Fibula	Fibula needle
5	9	Oberndorf	1982	6	4	Iron	Unknown	Lost sword	Weapon	Offensive	Sword	Sword type 1
5	9	Oberndorf	1982	6	5a	Iron	No	Tweezer	Adornment or clothing accessory	Toiletry	Tweezer	Tweezer
5	9	Oberndorf	1982	6	5b	Iron	No	Nail clipper or cutter	Adornment or clothing accessory	Toiletry	Nail Clipper	Nail clipper
5	9	Oberndorf	1982	6	6	Iron	No	Carving knife	Tool	Cutting	Knife	Carving knife type 1
5	9	Oberndorf	1982	6	8	Clay	Unknown	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 1
5	9	Oberndorf	1982	6	9	Clay	No	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho
5	9	Oberndorf	1982	6	10	Clay	Yes	small pot	Vessels and vessel implements	Storage and transport	Small Pots	Small pot type Bs 1
5	9	Oberndorf	1982	6	11	Clay	Yes	Small pot	Vessels and vessel implements	Storage and transport	Small Pots	Small pot type Ho 4
5	9	Oberndorf	1982	6	12	Iron	No	Coupling ring	Weapon	Costume (w)	Belt	Koppelring
5	9	Oberndorf	1982	6	13	Iron	Unknown	Fragment	Unidentified object	unidentified object	unidentified object	unidentified object
5	9	Oberndorf	1982	6	15	Silver	No	Ring	Adornment or clothing accessory	Costume	Ring	Fingering
5	9	Oberndorf	1982	6	16	Clay	Yes	bowl with omphalos and stamp	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2a
5	9	Oberndorf	1982	6	17	Iron	Unknown	Iron fragments	Unidentified object	unidentified object	unidentified object	unidentified object
6	13	Oberndorf	1982	7	3	Iron	No	Javelin head	Weapon	Offensive	Javelin	Javelin type 2
6	13	Oberndorf	1982	7	4	Iron	No	Javelin head	Weapon	Offensive	Javelin	Javelin type 3
6	13	Oberndorf	1982	7	6	Iron	No	Knife	Tool	Cutting	Knife	Knife type 4
6	13	Oberndorf	1982	7	7	Clay	Yes	Bowl, with omphalos	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 1
6	13	Oberndorf	1982	7	8	Clay	No	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 4
6	13	Oberndorf	1982	7	5	Iron	No	Ring, no context	Other	Ring finger sized ring	Ring	Iron ring
8	18	Oberndorf	1982	10	6	Clay	Yes	Bottle like vessel	Vessels and vessel implements	Drinking	Bottles and Bottle like vessels	Bottle like vessel type Hu 1a
8	18	Oberndorf	1982	10	7	Clay	Unknown	Lost vessel	Other	Vessel	Lost vessel	Lost vessel
8	18	Oberndorf	1982	10	8	Clay	Yes	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2a
8	18	Oberndorf	1982	10	9	Clay	Unknown	Lower vessel part, potentially pot	Other	Vessel	Ceramic fragment	Lower vessel part
8	18	Oberndorf	1982	10	10	Bronze	Yes	Fibula, FKF Marzabotta	Adornment or clothing accessory	Costume	Fibula	Fibula type Marzabotto
8	18	Oberndorf	1982	10	11	Bronze	Yes	Necklace	Adornment or clothing accessory	Costume	Chocker necklace	Necklace type 2
8	18	Oberndorf	1982	10	12	Bronze	Yes	Fibula, type Bird head	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
8	18	Oberndorf	1982	10	13	Bronze	Yes	Fibula FKF Marzabotta	Adornment or clothing accessory	Costume	Fibula	Fibula type Marzabotto
8	18	Oberndorf	1982	10	14	Bronze	Yes	Bracelet, smooth, decorated	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 2 open
8	18	Oberndorf	1982	10	15	Bronze	Yes	Bracelet, smooth, contoured	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 1 open
8	18	Oberndorf	1982	10	16	Iron	No	Belt hook	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
8	18	Oberndorf	1982	10	26	Clay	No	Spindle whorl	Tool	Weaving	Spindle whorl	Spindle whorl type 1
8	18	Oberndorf	1982	10	27	Iron	No	Carving knife	Tool	Cutting	Knife	Carving knife type 1
8	18	Oberndorf	1982	10	33	Clay	No	Beaker	Vessels and vessel implements	Drinking	Cups, tumblers and beaker	Beaker type Bs1
8	18	Oberndorf	1982	10	38	Bronze	Yes	Fingering, open, with overlapping ends	Adornment or clothing accessory	Costume	Ring	Fingering

Grave ID	Catalogue Nr.	Excavation Site	Year	Burial ID	Finding Nr.	Material	Decorated	Description	Category 1	Category 2	Category 3	Category 4
8	18	Oberndorf	1982	10	39	Bronze	No	Fingering, open	Adornment or clothing accessory	Costume	Ring	Fingering
8	18	Oberndorf	1982	9	4	Clay	Yes	Lenticular bottle	Vessels and vessel implements	Drinking	Bottles and Bottle like vessels	Lenticular bottle type Hu 1c
8	18	Oberndorf	1982	9	19	Unknown	Unknown	Fibula, lost fragment	Adornment or clothing accessory	Costume	Fibula	Fibula fragment
8	18	Oberndorf	1982	9	20	Bronze	Yes	Fibula, FKF, type Marzabotto	Adornment or clothing accessory	Costume	Fibula	Fibula type Marzabotto
8	18	Oberndorf	1982	9	21	Bronze	Yes	Fibula, FKF, type Marzabotto	Adornment or clothing accessory	Costume	Fibula	Fibula type Marzabotto
8	18	Oberndorf	1982	9	22	Bronze	Yes	Bracelet	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 1
8	18	Oberndorf	1982	9	23	Bronze	Yes	Bracelet	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 2 open
8	18	Oberndorf	1982	9	25	Unknown	Unknown	Belt hook lost	Adornment or clothing accessory	Costume	Belt	Belt hook type 2
8	18	Oberndorf	1982	9	30	Clay	Yes	Spindle whorl	Tool	Weaving	Spindle whorl	Spindle whorl type 1
8	18	Oberndorf	1982	9	31	Clay	Yes	Spindle whorl	Tool	Weaving	Spindle whorl	Spindle whorl type 1
8	18	Oberndorf	1982	9	32	Iron	No	Iron ring	Other	Ring finger sized ring	Ring	Iron ring
8	18	Oberndorf	1982	9	34	Iron	Unknown	Lost iron fragment	Unidentified object	unidentified object	unidentified object	unidentified object
8	18	Oberndorf	1982	9	35a	Bronze	Yes	Bronze fitting sheet	Other	Fitting	Bronze fitting	Bronze fitting
8	18	Oberndorf	1982	9	35b	Bronze	No	2 Bronze remains	Unidentified object	unidentified object	unidentified object	unidentified object
8	18	Oberndorf	1982	9	28 and 28a	Iron	No	Knife and 2 rivets	Tool	Cutting	Knife	Knife type 5
8	18	Oberndorf	1982	9	36	Amber	Unknown	Amber beads	Adornment or clothing accessory	Costume	Bead necklace	Amber bead
8	18	Oberndorf	1982	9	37/2	Glass	Unknown	Blue glass beads	Adornment or clothing accessory	Costume	Bead necklace	Glass bead
8	18	Oberndorf	1982	9	3	Clay	Yes	Situla like pot	Vessels and vessel implements	Drinking	Situla and cauldrons	Situla like pot type Ho 2
8	18	Oberndorf	1982	9	5	Clay	Yes	Bowl, with omphalos	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2a
8	18	Oberndorf	1982	9	17	Bronze	Yes	Choker like necklace	Adornment or clothing accessory	Costume	Chocker necklace	Necklace type 2
8	18	Oberndorf	1982	9	18	Bronze	Yes	Chocker like necklace	Adornment or clothing accessory	Costume	Chocker necklace	Necklace type 1
8	18	Oberndorf	1982	9	24	Bronze	Yes	Bracelet, possible fragmented at end	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 2 open
9	19	Oberndorf	1982	11	2	Bronze	Yes	Fibula FKF, Marzabotta	Adornment or clothing accessory	Costume	Fibula	Fibula type Marzabotto
9	19	Oberndorf	1982	11	3	Iron	No	Iron ring	Other	Ring finger sized ring	Ring	Iron ring
9	19	Oberndorf	1982	11	4	Iron	No	Belt Hook fragments	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
9	19	Oberndorf	1982	11	6	Clay	Yes	Large Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 4
9	19	Oberndorf	1982	11	7	Clay	Yes	Small bowl	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl type Bw 2a
9	19	Oberndorf	1982	11	8	Clay	Yes	Small pot	Vessels and vessel implements	Storage and transport	Small Pots	Small pot type Bs 1
9	19	Oberndorf	1982	11	9	Clay	Yes	Small pot	Vessels and vessel implements	Storage and transport	Small Pots	Small pot type Bs 1
9	19	Oberndorf	1982	11	10	Clay	Yes	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 1a
9	19	Oberndorf	1982	11	11	Clay	Unknown	Lost vessel	Other	Vessel	Lost vessel	Lost vessel
9	19	Oberndorf	1982	11	12	Silver	Unknown	Lost ring	Adornment or clothing accessory	Costume	Earring	Earring
10	25	Oberndorf	1982	-	14	Tooth	Yes	Perforated bear tooth	Adornment or clothing accessory	Costume	Pendants	Bear tooth pendant
10	25	Oberndorf	1982	13	3	Bronze	Yes	Fibula, (FKF) Marzabotta	Adornment or clothing accessory	Costume	Fibula	Fibula type Marzabotto
10	25	Oberndorf	1982	13	5	Iron	No	Iron ring, possible finger ring	Other	Ring finger sized ring	Ring	Iron ring
10	25	Oberndorf	1982	13	13	Iron	No	Iron ring, possible finger ring	Other	Ring finger sized ring	Ring	Iron ring
10	25	Oberndorf	1982	13	4	Iron	No	Iron fragment, with perforation	Unidentified object	unidentified object	unidentified object	unidentified object
10	25	Oberndorf	1982	12	6	Iron	No	Angular Iron fragment	Unidentified object	unidentified object	unidentified object	unidentified object
10	25	Oberndorf	1982	12	7	Iron	No	Knife	Tool	Cutting	Knife	Knife type 1
10	25	Oberndorf	1982	12	9	Clay	No	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 3z
10	25	Oberndorf	1982	12	10	Clay	Yes	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 1a
10	25	Oberndorf	1982	12	11	Clay	Yes	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Bs 1a
10	25	Oberndorf	1982	12	12	Clay	No	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Bs 1
11	26	Oberndorf	1982	14	3	Clay	No	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 1
11	26	Oberndorf	1982	14	4	Clay	Yes	Lenticular bottle	Vessels and vessel implements	Drinking	Bottles and Bottle like vessels	Lenticular bottle type Hu 2
11	26	Oberndorf	1982	14	5	Clay	Yes	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 1a
11	26	Oberndorf	1982	14	6	Bronze	Yes	Fibula, Type 'Vogelkopf'	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
11	26	Oberndorf	1982	14	7	Bronze	No	Bronze fingering	Adornment or clothing accessory	Costume	Ring	Fingering
11	26	Oberndorf	1982	14	8	Iron	No	Iron ring	Other	Ring finger sized ring	Ring	Iron ring
11	26	Oberndorf	1982	14	9	Iron	No	Belt hook	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
11	26	Oberndorf	1982	14	10	Iron	No	Knife	Tool	Cutting	Knife	Knife type 6
11	26	Oberndorf	1982	14	12	Clay	Yes	Bowl	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl type Bw 2a
12	28	Oberndorf	1982	-	27	Bronze	No	small bronze ring	Other	Ring finger sized ring	Ring	Bronze Ring
12	28	Oberndorf	1982	18	22	Bronze	No	Bronze Ring, semi-circular, open	Other	Ring finger sized ring	Ring	Bronze Ring
12	28	Oberndorf	1982	18	18	Iron	No	Bracelet	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 4 open
12	28	Oberndorf	1982	18	23	Bronze	Yes	Fibula, (FKF) Marzabotto	Adornment or clothing accessory	Costume	Fibula	Fibula type Marzabotto
12	28	Oberndorf	1982	18	21	Iron	No	Carving knife	Tool	Cutting	Knife	Carving knife type 1
12	28	Oberndorf	1982	18	14	Clay	No	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 1
12	28	Oberndorf	1982	17	16	Bronze	Yes	Chocker necklace	Adornment or clothing accessory	Costume	Chocker necklace	Necklace type 3
12	28	Oberndorf	1982	17	17	Bronze	Yes	Fibula, (FKF) Marzabotta	Adornment or clothing accessory	Costume	Fibula	Fibula type Marzabotto
12	28	Oberndorf	1982	17	19a and 19 b	Iron	No	Fragmented miniature adze	Tool	Cutting	Adze	Miniature adze
12	28	Oberndorf	1982	17	25	Bronze	Yes	Fibula, (FKF) Marzabotto	Adornment or clothing accessory	Costume	Fibula	Fibula type Marzabotto

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12	28	Oberndorf	1982	17	26	Iron	No	Box belt plaque	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
12	28	Oberndorf	1982	17	20	Bronze	Yes	Bracelet	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 4 open
12	28	Oberndorf	1982	17	24	Bronze	No	Fingering	Adornment or clothing accessory	Costume	Ring	Fingering
12	28	Oberndorf	1982	17	31	Iron	No	Iron ring, massive	Other	Ring finger sized ring	Ring	Iron ring
12	28	Oberndorf	1982	16	3	Iron	No	Javelin head	Weapon	Offensive	Javelin	Javelin type 2
12	28	Oberndorf	1982	16	4	Bronze	Yes	Fibula, (FSF) Marzabotta	Adornment or clothing accessory	Costume	Fibula	Fibula type Marzabotto
12	28	Oberndorf	1982	16	13	Bronze	Yes	Link chain necklace with pendant	Adornment or clothing accessory	Costume	Link chain necklace	Link chain necklace with pendant
12	28	Oberndorf	1982	16	15	Amber	Yes	Amber bead, perforated	Adornment or clothing accessory	Costume	Pendants	Amber bead
12	28	Oberndorf	1982	16	9	Bronze	Yes	Bracelet, hollow	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 3
12	28	Oberndorf	1982	16	10	Bronze	Yes	Bracelet, decorated, hollow, fragmented	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 5 fragmented
12	28	Oberndorf	1982	16	8	Iron	No	Belt hook	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
12	28	Oberndorf	1982	15	5	Clay	Unknown	Small Pot	Vessels and vessel implements	Storage and transport	Small Pots	Small pot type Ho 2
12	28	Oberndorf	1982	15	6	Clay	Unknown	Vessel, lower part	Other	Vessel	Ceramic fragment	Lower vessel part
13	29	Oberndorf	1982	19	2	Bronze	Yes	Fibula, type 'Vogelkopf'	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
13	29	Oberndorf	1982	19	3a	Iron	No	Iron ring	Other	Ring finger sized ring	Ring	Iron ring
13	29	Oberndorf	1982	19	13	Clay	Yes	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2
13	29	Oberndorf	1982	19	15	Clay	No	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 3
13	29	Oberndorf	1982	19	16	Clay	Yes	Bowl	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl type Bw 2a
13	29	Oberndorf	1982	19	17	Clay	Yes	Small pot	Vessels and vessel implements	Storage and transport	Small Pots	Small pot type Ho 2
13	29	Oberndorf	1982	19	18	Iron	Unknown	5 rod shaped fragments with traces of textile	Unidentified object	unidentified object	unidentified object	unidentified object
13	29	Oberndorf	1982	19	4	Bronze	No	Bracelet	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 4
13	29	Oberndorf	1982	19	5	Bronze	No	Bracelet	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 4
13	29	Oberndorf	1982	19	6	Iron	Yes	Knife	Tool	Cutting	Knife	Knife type 7
13	29	Oberndorf	1982	19	8	Iron	No	Box belt plaque	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
13	29	Oberndorf	1982	19	9a	Clay	Yes	Spindle whorl, double conic	Tool	Weaving	Spindle whorl	Spindle whorl type 1
13	29	Oberndorf	1982	19	9b	Clay	Yes	Spindle whorl, lower conic half	Tool	Weaving	Spindle whorl	Spindle whorl type 2
13	29	Oberndorf	1982	19	9c	Clay	No	Spindle whorl, irregular	Tool	Weaving	Spindle whorl	Spindle whorl
13	29	Oberndorf	1982	19	10	Clay	Yes	Small pot	Vessels and vessel implements	Storage and transport	Small Pots	Small pot type Hu 1a
13	29	Oberndorf	1982	19	11	Clay	No	Small bowl	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl type Bw 2a
13	29	Oberndorf	1982	19	12	Clay	Unknown	Vessel fragment, lower part, bottom and wall	Other	Vessel	Ceramic fragment	Lower vessel part
13	29	Oberndorf	1982	19	14	Clay	Yes	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Bs 1a
13	29	Oberndorf	1982	19	3b	Iron	No	Rivet	Other	Rivet	Rivet	Iron rivet
13	29	Oberndorf	1982	19	3c	Iron	Unknown	Fibula tension fragment	Adornment or clothing accessory	Costume	Fibula	Fibula fragment
14	30	Oberndorf	1982	20	2	Clay	No	Small vessel, without upper part or mouth, type bw	Other	Vessel	Ceramic fragment	Lower vessel part
14	30	Oberndorf	1982	20	3	Clay	No	Small pot	Vessels and vessel implements	Storage and transport	Small Pots	Small pot type Bs
14	30	Oberndorf	1982	20	4	Clay	Yes	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 3z
15	31	Oberndorf	1982	21	2	Bronze	Yes	Button	Adornment or clothing accessory	Costume	Button	Button
15	31	Oberndorf	1982	21	3	Bronze	Yes	Button	Adornment or clothing accessory	Costume	Button	Button
15	31	Oberndorf	1982	21	4	Bronze	Yes	Button	Adornment or clothing accessory	Costume	Button	Button
15	31	Oberndorf	1982	21	5	Bronze	Yes	Button	Adornment or clothing accessory	Costume	Button	Button
15	31	Oberndorf	1982	21	6	Bronze	Yes	Fibula, type 'Fußzierfibel'	Adornment or clothing accessory	Costume	Fibula	Fußzierfibel
15	31	Oberndorf	1982	21	07.Aug	Iron	No	Openwork belt hook and counterpart	Weapon	Costume (w)	Belt	Belt hook type 3
15	31	Oberndorf	1982	21	9	Iron	No	Spear head	Weapon	Offensive	Spear	Spear type 2
15	31	Oberndorf	1982	21	10	Clay	Yes	Pot, without lower part	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 2
15	31	Oberndorf	1982	21	11	Clay	No	Lower vessel part	Other	Vessel	Ceramic fragment	Lower vessel part
15	31	Oberndorf	1982	21	12	Clay	Yes	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2a
15	31	Oberndorf	1982	21	13	Iron	No	Knife blade	Tool	Cutting	Knife	Knife type 6
15	31	Oberndorf	1982	21	14	Iron	Yes	'Koppelring'	Weapon	Costume (w)	Belt	Koppelring
15	31	Oberndorf	1982	21	16	Clay	Yes	Small bowl, or porringer	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl type Bw 2a
16	78	Oberndorf	1982	23	3	Clay	No	Vessel fragment of the lower part, type H	Other	Vessel	Ceramic fragment	Lower vessel part
17	85	Oberndorf	1982	24	2	Clay	No	Vessel fragment, lower vessel part	Other	Vessel	Ceramic fragment	Lower vessel part
17	85	Oberndorf	1982	24	3	Clay	No	Cup, or small pot	Vessels and vessel implements	Storage and transport	Small Pots	Small pot type Hu 1
17	85	Oberndorf	1982	24	4	Clay	Yes	Bowl	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl type Bw 2a
17	85	Oberndorf	1982	24	6	Iron	No	Knife	Tool	Cutting	Knife	Knife type 4
17	85	Oberndorf	1982	24	7	Bronze	No	Cast residue	Tool	Metalworking	Cast residue	Cast residue
17	85	Oberndorf	1982	24	8	Silex	No	Silex tool, close to triangular	Tool	Cutting	Silex tool	Silex tool
17	85	Oberndorf	1982	24	9	Bronze	Yes	Fibula, type "Fußzier"	Adornment or clothing accessory	Costume	Fibula	Fußzierfibel
17	85	Oberndorf	1982	24	10	Bronze	Yes	Fibula, type "Doppelpaukenfibel"	Adornment or clothing accessory	Costume	Fibula	Doppelpaukenfibel
17	85	Oberndorf	1982	24	11	Bronze	No	Bracelet, full cast	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 4
17	85	Oberndorf	1982	24	12	Bronze	No	Bracelet fragment	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 4 fragmented
18	89	Oberndorf	1982	25	1	Clay	No	Vessel, only lower vessel part, type H	Other	Vessel	Lost vessel	Lost vessel
18	89	Oberndorf	1982	25	2	Bronze	No	Bracelet	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 4 open

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19	102	Oberndorf	1982	26	1	Clay	Unknown	Ceramic fragment, decayed	Other	Vessel	Ceramic fragment	Small ceramic fragment
19	102	Oberndorf	1982	26	2	Clay	Unknown	Vessel, lost	Other	Vessel	Lost vessel	Lost vessel
19	102	Oberndorf	1982	26	4	Bronze	No	Bracelet	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 4
19	102	Oberndorf	1982	26	5a	Iron	Yes	'Koppelring'	Weapon	Costume (w)	Belt	Koppelring
19	102	Oberndorf	1982	26	5b	Iron	Yes	Koppelring', witch remnants of textile	Weapon	Costume (w)	Belt	Koppelring
19	102	Oberndorf	1982	26	6	Bronze	No	Bracelet	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 4
19	102	Oberndorf	1982	26	7	Bronze	Yes	Fibula, type 'Fußzier'	Adornment or clothing accessory	Costume	Fibula	Fußzierfibel
19	102	Oberndorf	1982	26	8	Iron	Unknown	Open worked belt hook, fragmented, with remnants of textile	Weapon	Costume (w)	Belt	Belt hook type 3
19	102	Oberndorf	1982	26	9	Iron	No	Knife, fragmented	Tool	Cutting	Knife	Knife fragment
19	102	Oberndorf	1982	26	12	Iron	No	Iron fragment, with perforation	Unidentified object	unidentified object	unidentified object	unidentified object
19	102	Oberndorf	1982	26	13	Clay	Unknown	Vessel, lost, inside of Fnr 1 (also lost)	Other	Vessel	Lost vessel	Lost vessel
19	102	Oberndorf	1982	26	14.Jän	Iron	Yes	Koppelring', with remands of textile	Weapon	Costume (w)	Belt	Koppelring
19	102	Oberndorf	1982	26	14.Feb	Iron	No	Larger iron ring, fragmented, possible coupling ring	Other	Bracelet sized ring	Ring	Iron ring
19	102	Oberndorf	1982	26	15	Iron	No	Larger iron ring, fragmented, possible coupling ring	Other	Bracelet sized ring	Ring	Iron ring
20	118	Oberndorf	1982	27	2	Clay	Unknown	Vessel, lost	Other	Vessel	Lost vessel	Lost vessel
20	118	Oberndorf	1982	27	3	Bronze	Yes	Sheet, fragmented, maybe part of a belt	Unidentified object	unidentified object	unidentified object	unidentified object
21	121	Oberndorf	1982	28	2	Bronze	Yes	Ankle bracelet	Adornment or clothing accessory	Costume	Anklet	Anklet type 1
21	121	Oberndorf	1982	28	3	Bronze	Yes	Ankle bracelet	Adornment or clothing accessory	Costume	Anklet	Anklet type 1
21	121	Oberndorf	1982	28	4	Bronze	No	Bracelet	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 4
21	121	Oberndorf	1982	28	5	Bronze	No	Bracelet	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 4
21	121	Oberndorf	1982	28	5	Bronze	Yes	Fibula, type drum, Weidach	Adornment or clothing accessory	Costume	Fibula	Paukenfibel type Weidach
21	121	Oberndorf	1982	28	7	Bronze	No	Fingering, overlapping ends	Adornment or clothing accessory	Costume	Ring	Fingering
21	121	Oberndorf	1982	28	8	Bronze	No	Fingering, overlapping ends	Adornment or clothing accessory	Costume	Ring	Fingering
21	121	Oberndorf	1982	28	9	Clay	No	Vessel fragment, bottom and wall	Other	Vessel	Ceramic fragment	Lower vessel part
21	121	Oberndorf	1982	28	10	Clay	No	Small pot	Vessels and vessel implements	Storage and transport	Small Pots	Small pot type Bs 1
21	121	Oberndorf	1982	28	11	Clay	No	Wall fragment	Other	Vessel	Ceramic fragment	Wall fragment
22	12	Oberndorf	2004	29	2	Bronze	Yes	Fibula, FKF, type 'Vogelkopf'	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
22	12	Oberndorf	2004	29	3	Iron	No	Iron fragment, unidentified, triangular	Unidentified object	unidentified object	unidentified object	unidentified object
22	12	Oberndorf	2004	29	4	Iron	No	Knife, tang with rivet	Tool	Cutting	Knife	Knife type 6
22	12	Oberndorf	2004	29	5	Clay	Yes	Small pot	Vessels and vessel implements	Storage and transport	Small Pots	Small pot type Ho 3a
22	12	Oberndorf	2004	29	7	Clay	Yes	Beaker like vessel	Vessels and vessel implements	Drinking	Cups, tumblers and beaker	Beaker
23	213	Oberndorf	2004	30	2	Clay	Yes	Spindle whorl, double conic	Tool	Weaving	Spindle whorl	Spindle whorl type 1
23	213	Oberndorf	2004	30	4	Bronze	Yes	Fibula, type 'Vogelkopf'	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
23	213	Oberndorf	2004	30	5	Glass	Yes	Glass bead, blue	Adornment or clothing accessory	Costume	Bead necklace	Glass bead
23	213	Oberndorf	2004	30	6	Iron	No	Iron ring	Other	Ring finger sized ring	Ring	Iron ring
23	213	Oberndorf	2004	30	8	Bronze	Yes	Fibula, type Marzabotta	Adornment or clothing accessory	Costume	Fibula	Fibula type Marzabotto
23	213	Oberndorf	2004	30	9	Bronze	Yes	Fibula, type Marzabotta	Adornment or clothing accessory	Costume	Fibula	Fibula type Marzabotto
23	213	Oberndorf	2004	30	10	Iron	No	Iron ring fragment, half	Other	Ring finger sized ring	Ring	Iron ring
23	213	Oberndorf	2004	30	11	Glass	Yes	Glass bead, blue	Adornment or clothing accessory	Costume	Bead necklace	Glass bead
23	213	Oberndorf	2004	30	12	Amber	Yes	Amber bead	Adornment or clothing accessory	Costume	Bead necklace	Amber bead
23	213	Oberndorf	2004	30	13	Iron	No	Iron fragment, slightly bend	Unidentified object	unidentified object	unidentified object	unidentified object
23	213	Oberndorf	2004	30	14	Bronze	Yes	Fibula fragment	Adornment or clothing accessory	Costume	Fibula	Fibula fragment
23	213	Oberndorf	2004	30	15	Clay	No	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 3
23	213	Oberndorf	2004	30	17	Clay	Yes	Small pot	Vessels and vessel implements	Storage and transport	Small Pots	Small pot type Bs 1a
23	213	Oberndorf	2004	30	21	Iron	No	Knife, with tang	Tool	Cutting	Knife	Knife type 4
24	14	Oberndorf	2004	31	2	Iron	No	Knife	Tool	Cutting	Knife	Knife type 3
24	14	Oberndorf	2004	31	3	Iron	No	Bracelet like ring	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 4 open
24	14	Oberndorf	2004	31	4	Iron	No	Anklet like ring	Adornment or clothing accessory	Costume	Anklet	Anklet type 2
24	14	Oberndorf	2004	31	5	Clay	Yes	Small pot	Vessels and vessel implements	Storage and transport	Small Pots	Small pot type Hu 1a
24	14	Oberndorf	2004	31	6	Bronze	No	Ring	Other	Bracelet sized ring	Ring	Bronze ring
25	15	Oberndorf	2004	32	3	Iron	No	Iron ring	Other	Ring finger sized ring	Ring	Iron ring
25	15	Oberndorf	2004	32	4	Iron	No	Iron fragment, bend	Unidentified object	unidentified object	unidentified object	unidentified object
25	15	Oberndorf	2004	32	5	Clay	No	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 3
25	15	Oberndorf	2004	32	6	Clay	Yes	Cup, with handle	Vessels and vessel implements	Drinking	Cups, tumblers and beaker	Cup type Bw 1a
25	15	Oberndorf	2004	32	8	Clay	No	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Bs 1
26	216	Oberndorf	2004	33	1	Iron	No	Rivet	Other	Rivet	Rivet	Iron rivet
26	216	Oberndorf	2004	33	2	Bronze	Yes	Fibula, type Marzabotta	Adornment or clothing accessory	Costume	Fibula	Fibula type Marzabotto
26	216	Oberndorf	2004	33	3	Clay	No	Bottle like vessel	Vessels and vessel implements	Drinking	Bottles and Bottle like vessels	Bottle like vessel type Hu 1
26	216	Oberndorf	2004	33	4	Clay	No	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 3z
26	216	Oberndorf	2004	33	6	Iron	No	Fibula, fragment	Adornment or clothing accessory	Costume	Fibula	Fibula fragment
27	17	Oberndorf	2004	34	2	Iron	No	Fibula, fragmented	Adornment or clothing accessory	Costume	Fibula	Fibula fragment
27	17	Oberndorf	2004	34	3	Iron	No	Iron fragment, slightly convex	Unidentified object	unidentified object	unidentified object	unidentified object

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27	17	Oberndorf	2004	34	4	Iron	No	Iron ring, open	Other	Ring finger sized ring	Ring	Iron ring
27	17	Oberndorf	2004	34	5	Iron	No	Belt hook, with rivet	Adornment or clothing accessory	Costume	Belt	Belt hook type 2
27	17	Oberndorf	2004	34	6	Clay	Unknown	Vessel fragment, lost	Other	Vessel	Ceramic fragment	Small ceramic fragment
28	218	Oberndorf	2004	35	2	Bronze	Yes	Fibula, type Duchcov, with greater terminal knob	Adornment or clothing accessory	Costume	Fibula	Fibula type Duchcov
28	218	Oberndorf	2004	35	3	Iron	No	Knife, with hilt plate and rivet	Tool	Cutting	Knife	Knife type 8
28	218	Oberndorf	2004	35	4	Clay	Yes	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 3a
29	20	Oberndorf	2004	36	3	Iron	No	Box belt plaque	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
29	20	Oberndorf	2004	36	4	Iron	No	Iron disc, with loop	Unidentified object	unidentified object	unidentified object	unidentified object
29	20	Oberndorf	2004	36	5	Iron	No	Iron fragment	Unidentified object	unidentified object	unidentified object	unidentified object
29	20	Oberndorf	2004	36	10	Clay	Yes	Small bowl	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl type Bw 1a
29	20	Oberndorf	2004	36	7	Clay	Yes	Vessel, bottle like Vessel fragment	Vessels and vessel implements	Drinking	Bottles and Bottle like vessels	Bottle or bottle like vessel
29	20	Oberndorf	2004	36	8	Clay	Yes	Vessel, bottle like	Vessels and vessel implements	Drinking	Bottles and Bottle like vessels	Bottle like vessel type Ho 3a
29	20	Oberndorf	2004	36	9	Clay	Yes	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2a
30	21	Oberndorf	2004	37	11a	Iron	No	Knife, with bone hilt	Tool	Cutting	Knife	Knife type 2
30	21	Oberndorf	2004	37	11b	Iron	No	Square shaft	Other	Shaft	Square shaft	Square shaft
30	21	Oberndorf	2004	37	13	Clay	Yes	Bottle like vessel	Vessels and vessel implements	Drinking	Bottles and Bottle like vessels	Bottle like vessel type Hu 1a
30	21	Oberndorf	2004	37	14	Clay	Unknown	Vessel, decayed	Other	Vessel	Lost vessel	Decayed vessel
30	21	Oberndorf	2004	37	15	Clay	Unknown	Vessel, decayed	Other	Vessel	Lost vessel	Decayed vessel
30	21	Oberndorf	2004	37	2	Iron	Unknown	Sword, lost	Weapon	Offensive	Sword	Sword type 1
30	21	Oberndorf	2004	37	3	Iron	No	Rivet	Other	Rivet	Rivet	Iron rivet
30	21	Oberndorf	2004	37	4	Iron	No	Rivet	Other	Rivet	Rivet	Iron rivet
30	21	Oberndorf	2004	37	5	Iron	No	Rivet	Other	Rivet	Rivet	Iron rivet
30	21	Oberndorf	2004	37	6	Iron	No	Rivet	Other	Rivet	Rivet	Iron rivet
30	21	Oberndorf	2004	37	7	Iron	Unknown	'Koppelring', lost	Weapon	Costume (w)	Belt	Koppelring
30	21	Oberndorf	2004	37	8	Iron	Unknown	'Koppelring', lost	Weapon	Costume (w)	Belt	Koppelring
30	21	Oberndorf	2004	37	9	Iron	No	Box belt plaque	Weapon	Costume (w)	Belt	Belt hook type 1
30	21	Oberndorf	2004	37	10	Iron	Unknown	Fibula, fragment	Adornment or clothing accessory	Costume	Fibula	Fibula fragment
30	21	Oberndorf	2004	37	11c	Bronze	No	Cast residue	Tool	Metalworking	Cast residue	Cast residue
31	225	Oberndorf	2004	38	2	Iron	No	Box belt plaque, fragmented	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
31	225	Oberndorf	2004	38	4	Clay	Unknown	Lower vessel part	Other	Vessel	Lost vessel	Lost vessel
31	225	Oberndorf	2004	38	5	Clay	Yes	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 1
31	225	Oberndorf	2004	38	6	Clay	Yes	Vessel Wall fragment, potentially bottle, double convex	Other	Vessel	Ceramic fragment	Wall fragment
32	27	Oberndorf	2004	39	2	Iron	No	Javelin head	Weapon	Offensive	Javelin	Javelin type 2
32	27	Oberndorf	2004	39	3	Iron	No	Javelin head	Weapon	Offensive	Javelin	Javelin type 2
32	27	Oberndorf	2004	39	4	Iron	No	Box belt plaque	Weapon	Costume (w)	Belt	Belt hook type 1
32	27	Oberndorf	2004	39	5	Clay	No	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 3a
32	27	Oberndorf	2004	39	6	Clay	Yes	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 1a
32	27	Oberndorf	2004	39	7	Iron	No	Knife, with tang, cuff on handle	Tool	Cutting	Knife	Knife type 1
33	34	Oberndorf	2004	40	1	Clay	No	Urn, biconical	Vessels and vessel implements	Burial rite	Urn	Urn type biconical
33	34	Oberndorf	2004	40	3	Clay	Yes	Small bowl	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl type Bw 1a
33	34	Oberndorf	2004	40	4	Clay	Yes	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 1
33	34	Oberndorf	2004	40	5	Iron	No	Knife, under bowl (4)	Tool	Cutting	Knife	Knife type 3
33	34	Oberndorf	2004	40	7	Clay	Unknown	Base fragment	Other	Vessel	Ceramic fragment	Base fragment
33	34	Oberndorf	2004	40	8	Clay	Yes	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 3a
33	34	Oberndorf	2004	40	10	Silex	No	Silex fragment	Unidentified object	unidentified object	unidentified object	unidentified object
34	35	Oberndorf	2004	41	2	Iron	No	Double rivet	Other	Rivet	Rivet	Iron rivet
35	229	Oberndorf	2004	42	2	Iron	No	Box belt plaque	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
35	229	Oberndorf	2004	42	3	Iron	No	Ring	Other	Ring finger sized ring	Ring	Iron ring
35	229	Oberndorf	2004	42	4	Bronze	No	Earring	Adornment or clothing accessory	Costume	Earring	Earring
35	229	Oberndorf	2004	42	5	Clay	Yes	Pot, biconical	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 3a
35	229	Oberndorf	2004	42	7	Clay	Yes	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2a
36	37	Oberndorf	2004	43	3	Iron	Yes	Javelin head	Weapon	Offensive	Javelin	Javelin type 4
36	37	Oberndorf	2004	43	4	Iron	No	Javelin head, fragmented	Weapon	Offensive	Javelin	Javelin fragment
36	37	Oberndorf	2004	43	5	Clay	Yes	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 3a
36	37	Oberndorf	2004	43	6	Clay	Yes	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 3z
36	37	Oberndorf	2004	43	7	Iron	No	Carving knife	Tool	Cutting	Knife	Carving knife type 1
36	37	Oberndorf	2004	43	9	Iron	No	Iron ring, open	Other	Ring finger sized ring	Ring	Iron ring
36	37	Oberndorf	2004	43	10	Iron	No	Knife, approx.. disc like handle	Tool	Cutting	Knife	Knife type 8
36	37	Oberndorf	2004	43	11a	Antler	No	Unidentified antler object, hollowed, red dear	Unidentified object	unidentified object	unidentified object	unidentified object
36	37	Oberndorf	2004	43	11b	Antler	Yes	Unidentified antler object, red deer	Unidentified object	unidentified object	unidentified object	unidentified object
36	37	Oberndorf	2004	43	12	Antler	Yes	Unidentified antler object, red deer	Unidentified object	unidentified object	unidentified object	unidentified object
36	37	Oberndorf	2004	43	14a	Iron	No	Box belt plaque	Weapon	Costume (w)	Belt	Belt hook type 1

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36	37	Oberndorf	2004	43	13	Iron	No	Iron fragments, probably from belt	Weapon	Costume (w)	Belt	Belt component
36	37	Oberndorf	2004	43 14b		Iron	No	Small Disc, with rivet, probably part of belt	Weapon	Costume (w)	Belt	Belt component
36	37	Oberndorf	2004	43	15	Iron	No	Ring, probably part of belt	Weapon	Costume (w)	Belt	Belt component
37	44	Oberndorf	2004	44	6	Clay	Yes	Small bowl	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl type Bw 2a
37	44	Oberndorf	2004	44	12	Clay	No	Vessel fragment, lower part	Other	Vessel	Ceramic fragment	Lower vessel part
37	44	Oberndorf	2004	44 13a		Iron	No	Iron ring with loop	Other	Ring finger sized ring	Ring	Iron ring
37	44	Oberndorf	2004	44 13b		Iron	No	Iron ring	Other	Ring finger sized ring	Ring	Iron ring
37	44	Oberndorf	2004	44 13c		Iron	No	Iron ring, fragmented	Other	Ring finger sized ring	Ring	Iron ring
37	44	Oberndorf	2004	44 13d		Iron	No	Iron fragment	Unidentified object	unidentified object	unidentified object	unidentified object
37	44	Oberndorf	2004	44	8	Clay	Yes	Urn	Vessels and vessel implements	Burial rite	Urn	Urn type Ho 4a
37	44	Oberndorf	2004	44	2	Glass	Yes	Layered eyed glass bead	Adornment or clothing accessory	Costume	Bead necklace	Layered Eyed Glass Bead
37	44	Oberndorf	2004	44	3	Bronze	No	Bracelet, hollow, closed	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 3
37	44	Oberndorf	2004	44	4	Bronze	No	Bracelet, hollow, closed	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 3
37	44	Oberndorf	2004	44	5	Clay	Unknown	Lower vessel fragment	Other	Vessel	Ceramic fragment	Lower vessel part
39	77	Oberndorf	2004	47	77	Clay	No	Urn with remains	Vessels and vessel implements	Burial rite	Urn	Urn type Ho 2
40	316	Oberndorf	2012	48	106	Clay	Yes	Larger Vessel, fragmented	Other	Vessel	Ceramic fragment	Upper vessel part
40	316	Oberndorf	2012	48	132	Clay	No	Pot, fragmented	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho
41	325	Ossarn	1963	49	1	Clay	Unknown	Pot, fragmented	Vessels and vessel implements	Storage and transport	Pots	Pot type Bs 3
41	325	Ossarn	1963	49	2	Clay	Yes	Bottle like vessel, misses lip	Vessels and vessel implements	Drinking	Bottles and Bottle like vessels	Bottle like vessel type Ho 3a
41	325	Ossarn	1963	49	3	Clay	Yes	Biconical pot	Vessels and vessel implements	Storage and transport	Pots	Biconical pot type Ho 4a
41	325	Ossarn	1963	49	4	Iron	No	Simple belt hook	Adornment or clothing accessory	Costume	Belt	Belt hook type 2
41	325	Ossarn	1963	49	5	Clay	Yes	Small bowl, with omph.	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl type Bw 2a
42	1	Ossarn	1966	50	1	Clay	Unknown	Lower vessel fragment	Other	Vessel	Ceramic fragment	Base fragment
42	1	Ossarn	1966	50	2	Clay	Yes	Small pot	Vessels and vessel implements	Storage and transport	Small Pots	Small pot type Bs 1a
42	1	Ossarn	1966	50	3	Bronze	Yes	Fibula, type 'Doppelpaukenfibel', subtype Speikern	Adornment or clothing accessory	Costume	Fibula	Doppelpaukenfibel type Speikern
42	1	Ossarn	1966	50 4a		Bronze	Yes	Bracelet, fragmented, ripped/corrugated	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 6 fragmented
42	1	Ossarn	1966	50 4b		Bronze	Yes	Bracelet, fragmented, ripped/corrugated	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 6 fragmented
42	1	Ossarn	1966	50	5	Bronze	No	Small bronze ring, with overlapping ends	Other	Ringfinger sized ring	Ring	Bronze Ring
42	1	Ossarn	1966	50	6	Glass	No	Glass bead, yellow-brown	Adornment or clothing accessory	Costume	Bead necklace	Glass bead
42	1	Ossarn	1966	50	7	Glass	No	Glass bead, cobalt blue	Adornment or clothing accessory	Costume	Bead necklace	Glass bead
42	1	Ossarn	1966	50	8	Glass	Yes	Glass bead, light green, decorated with 7 grooves	Adornment or clothing accessory	Costume	Bead necklace	Glass bead
42	1	Ossarn	1966	50	9	Glass	Yes	Layer Eyed glass bead, opaque-yellow, 8 white-blue layered eyes	Adornment or clothing accessory	Costume	Bead necklace	Layered Eyed Glass Bead
42	1	Ossarn	1966	50	10	Glass	Yes	Layer Eyed glass bead, opaque-yellow, 8 white-blue layered eyes	Adornment or clothing accessory	Costume	Bead necklace	Layered Eyed Glass Bead
42	1	Ossarn	1966	50	11	Bone	Yes	Bone Bead, decorated with centric circumferential thickening	Adornment or clothing accessory	Costume	Bead necklace	Bone bead
42	1	Ossarn	1966	50	12	Iron	No	Box belt plaque	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
42	1	Ossarn	1966	50	13	Iron	No	Triangular belt hook	Adornment or clothing accessory	Costume	Belt	Belt hook type 4
43	2	Ossarn	1966	51	1	Clay	Yes	Upper vessel part, fragmented	Other	Vessel	Ceramic fragment	Upper vessel part
43	2	Ossarn	1966	51	2	Clay	Unknown	Wall fragment	Other	Vessel	Ceramic fragment	Wall fragment
43	2	Ossarn	1966	51	4	Iron	Unknown	Knife, with tang	Tool	Cutting	Knife	Knife type 4
44	204	Ossarn	1966	52	1	Clay	Unknown	Bowl, lip fragments	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 3z
44	204	Ossarn	1966	52	2	Clay	Unknown	Vessel fragment, inconclusive	Other	Vessel	Ceramic fragment	Small ceramic fragment
44	204	Ossarn	1966	52	3	Clay	Unknown	Bottle like vessel, fragmented, wall, base and mouth	Vessels and vessel implements	Drinking	Bottles and Bottle like vessels	Bottle like vessel type Hu
44	204	Ossarn	1966	52	4	Clay	Unknown	Vessel fragment, inconclusive	Other	Vessel	Ceramic fragment	Small ceramic fragment
44	204	Ossarn	1966	52	5	Clay	Unknown	Vessel fragment, inconclusive	Other	Vessel	Ceramic fragment	Small ceramic fragment
44	204	Ossarn	1966	52	6	Iron	Unknown	Fibula, fragmented	Adornment or clothing accessory	Costume	Fibula	Fibula fragment
44	204	Ossarn	1966	52	7	Iron	Unknown	Fragments, tension and flat fragments	Unidentified object	unidentified object	unidentified object	unidentified object
45	306	Ossarn	1966	53	1	Clay	No	Bottle like vessel	Vessels and vessel implements	Drinking	Bottles and Bottle like vessels	Bottle like vessel type Ho 4a
45	306	Ossarn	1966	53	2	Clay	Yes	Small bowl	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl type Bw 2a
45	306	Ossarn	1966	53 3a		Bronze	Yes	Bracelet, scratched decoration	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 2
45	306	Ossarn	1966	53 3b		Bronze	Yes	Bracelet, scratched decoration	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 2
45	306	Ossarn	1966	53	4	Iron	Unknown	Fibula fragment, type 'Vogelkopf'	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
45	306	Ossarn	1966	53	5	Iron	Unknown	Belt hook/plaque fragment	Adornment or clothing accessory	Costume	Belt	Belt hook fragment
46	7	Ossarn	1966	54	1	Clay	Unknown	2 base-wall fragments, 1 base fragment, 1 mouth-wall fragment	Other	Vessel	Inconclusive vessel fragments	Multiple fragments
46	7	Ossarn	1966	54	2	Clay	Yes	Base-wall fragments with omph.	Other	Vessel	Inconclusive vessel fragments	Multiple fragments
46	7	Ossarn	1966	54 3+4		Clay	Yes	Base-Wall fragments, with omph.	Other	Vessel	Inconclusive vessel fragments	Multiple fragments
47	8	Ossarn	1969	81	1	Iron	No	Box belt plaque	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
47	8	Ossarn	1969	81 2a		Bronze	Yes	Bracelet	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 2
47	8	Ossarn	1969	81 2b		Bronze	Yes	Bracelet	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 2
47	8	Ossarn	1969	81	3	Bronze	Yes	Fibula, type 'Vogelkopf'	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
47	8	Ossarn	1969	81	4	Bronze	No	Small coil, overlapping ends	Unidentified object	unidentified object	unidentified object	unidentified object
47	8	Ossarn	1969	81	5	Clay	No	Bottle like vessel	Vessels and vessel implements	Drinking	Bottles and Bottle like vessels	Bottle like vessel type Hu 1a
47	8	Ossarn	1969	81	1	Clay	No	Spindle whorl, stray find	Tool	Weaving	Spindle whorl	Spindle whorl type 3

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47	8	Ossarn	1969	81	2	Clay	No	Spindle whorl, stray find	Tool	Weaving	Spindle whorl	Spindle whorl
47	8	Ossarn	1969	81	3	Bronze	Yes	Box belt plaque, decorated, stray found	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
47	8	Ossarn	1969	81	4a	Bronze	Yes	Rivet, decorated with concentric circles	Other	Rivet	Rivet	Bronze rivet
47	8	Ossarn	1969	81	4b	Bronze	Yes	Rivet, decorated with concentric circles	Other	Rivet	Rivet	Bronze rivet
47	8	Ossarn	1969	81	4c	Bronze	Yes	Rivet, decorated by segments, hallmarked in middle segment	Other	Rivet	Rivet	Bronze rivet
48	205	Ossarn	1984	57	1	Bronze	Yes	Bracelet, hollow, decorated	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 5 fragmented
48	205	Ossarn	1984	57	2	Bronze	Yes	Bracelet, hollow, decorated, only fragments	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 5 fragmented
48	205	Ossarn	1984	57	3	Clay	Unknown	Beaker, fragmented	Vessels and vessel implements	Drinking	Cups, tumblers and beaker	Beaker
48	205	Ossarn	1984	57	4	Clay	Unknown	Large bowl, fragmented	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 3z
48	205	Ossarn	1984	57	5	Clay	Unknown	Pot, fragmented	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho
48	205	Ossarn	1984	57	7a	Bronze	Yes	Fibula, type 'Doppelpaukenfibel', subtype Speikern	Adornment or clothing accessory	Costume	Fibula	Doppelpaukenfibel type Speikern
48	205	Ossarn	1984	57	7b	Bronze	Yes	Fibula, type 'Vogelkopf'	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
48	205	Ossarn	1984	57	8	Iron	No	Box belt plaque	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
49	206	Ossarn	1984	59	9	Bronze	No	Box belt plaque	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
49	206	Ossarn	1984	58	3	Clay	No	Small bowl, fragmented	Vessels and vessel implements	Drinking	Bowls and porringers	Small Bowl Bs 5
49	206	Ossarn	1984	58	1	Clay	Unknown	Urn, lost, described as grey pot with cremation remains	Vessels and vessel implements	Burial rite	Urn	Urn
49	206	Ossarn	1984	58	2	Clay	Yes	Urn, lost, described as red	Vessels and vessel implements	Burial rite	Urn	Urn type Hu 1a
49	206	Ossarn	1984	58	4	Bronze	Yes	Bracelet, hollow, fragmented, profiled ends	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 5 fragmented
49	206	Ossarn	1984	58	5	Bronze	Yes	Bracelet, hollow, fragmented, profiled ends	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 5 fragmented
50	207	Ossarn	1984	62	1	Iron	No	Box belt plaque	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
50	207	Ossarn	1984	62	2(b)	Clay	No	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 3z
50	207	Ossarn	1984	62	3	Clay	Unknown	Lost vessel, potential pot	Other	Vessel	Lost vessel	Lost vessel
50	207	Ossarn	1984	62	4	Clay	Unknown	Pot, fragmented	Vessels and vessel implements	Storage and transport	Pots	Pot
50	207	Ossarn	1984	62	5	Clay	Yes	Large bowl, with omph.	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 1
50	207	Ossarn	1984	62	6	Clay	No	Small bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 3v
50	207	Ossarn	1984	62	7	Iron	No	Knife, with flat tang	Tool	Cutting	Knife	Knife type 9
50	207	Ossarn	1984	62	8	Iron	No	Knife	Tool	Cutting	Knife	Knife type 6
51	208	Ossarn	1984	63	1	Clay	Unknown	Small pot, lost, described to be grey	Vessels and vessel implements	Storage and transport	Small Pots	Small pot
51	208	Ossarn	1984	63	2	Clay	Unknown	Small bowl, lost, described as being red	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl
51	208	Ossarn	1984	63	3	Iron	Unknown	Iron fragment, lost	Unidentified object	unidentified object	unidentified object	unidentified object
52	212	Ossarn	1984	64	2a	Iron	No	Iron ring, open	Other	Ring finger sized ring	Ring	Iron ring
52	212	Ossarn	1984	64	2b	Iron	No	Iron ring, open	Other	Ring finger sized ring	Ring	Iron ring
52	212	Ossarn	1984	64	4	Clay	Unknown	Bowl, lost, defined by approx. size on table	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw
52	212	Ossarn	1984	64	5	Clay	Unknown	Bottle like vessel, lost	Vessels and vessel implements	Drinking	Bottles and Bottle like vessels	Bottle or bottle like vessel
52	212	Ossarn	1984	64	6	Clay	Unknown	Base fragment(s), lost, potential pot	Other	Vessel	Ceramic fragment	Base fragment
52	212	Ossarn	1984	64	8	Bronze	Yes	Fibula, type Certosa	Adornment or clothing accessory	Costume	Fibula	Certosa Fibula
52	212	Ossarn	1984	64	3	Iron	No	Box belt plaque	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
53	313	Ossarn	1984	65	2	Iron	Unknown	Dress pin, lost	Adornment or clothing accessory	Costume	Dress pin	Dress pin
53	313	Ossarn	1984	65	3	Iron	No	Box belt plaque, with Koppelring	Weapon	Costume (w)	Belt	Belt hook type 1
53	313	Ossarn	1984	65	4	Iron	No	'Koppelring'	Weapon	Costume (w)	Belt	Koppelring
53	313	Ossarn	1984	65	5	Clay	Unknown	Lost vessel	Other	Vessel	Lost vessel	Lost vessel
53	313	Ossarn	1984	65	6	Clay	Unknown	Lost bowl, defined based on table and definition as bowl in list	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw
53	313	Ossarn	1984	65	7	Clay	Unknown	Lost vessel fragments	Other	Vessel	Lost vessel	Lost vessel
54	214	Ossarn	1984	66	2	Unknown	Unknown	Box belt plaque, lost	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
54	214	Ossarn	1984	66	3	Iron	Unknown	Ring, lost	Adornment or clothing accessory	Costume	Belt	Belt component
54	214	Ossarn	1984	66	4	Clay	Unknown	Vessel, lost, described as large	Other	Vessel	Lost vessel	Lost vessel
54	214	Ossarn	1984	66	5	Clay	Unknown	Base fragment, lost	Other	Vessel	Ceramic fragment	Base fragment
54	214	Ossarn	1984	66	7	Clay	Unknown	Small bowl, lost	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl
55	215	Ossarn	1984	-	3	Bronze	Unknown	Small ring	Other	Ring finger sized ring	Ring	Bronze Ring
55	215	Ossarn	1984	-	4	Clay	Unknown	Lower vessel fragment	Other	Vessel	Ceramic fragment	Lower vessel part
55	215	Ossarn	1984	-	5a	Clay	Unknown	Upper vessel fragment	Other	Vessel	Ceramic fragment	Rim fragment
55	215	Ossarn	1984	-	5b	Clay	Unknown	Bowl, very fragmented	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw
56	217	Ossarn	1984	69	2a	Bronze	No	Reel like object	Unidentified object	unidentified object	unidentified object	unidentified object
56	217	Ossarn	1984	69	2b	Glass	No	Glass bead	Adornment or clothing accessory	Costume	Bead necklace	Glass bead
56	217	Ossarn	1984	69	3	Bronze	Yes	Chocker necklace, twisted, hook-loop closure	Adornment or clothing accessory	Costume	Chocker necklace	Necklace type 4
56	217	Ossarn	1984	69	4	Bronze	Yes	'Sphinx' fibula, type figural, with crossbow construction	Adornment or clothing accessory	Costume	Fibula	Figural Fibula
56	217	Ossarn	1984	69	5	Bronze	Yes	Box belt plaque, richly decorated	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
56	217	Ossarn	1984	69	6a	Bronze	Yes	Rivet, decorated	Adornment or clothing accessory	Costume	Belt	Belt component
56	217	Ossarn	1984	69	6b	Bronze	Yes	Rivet, decorated	Adornment or clothing accessory	Costume	Belt	Belt component
56	217	Ossarn	1984	69	7	Bronze	Yes	Fibula, early abstracted type 'Vogelkopf', 2x2 tension	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
56	217	Ossarn	1984	69	8	Bronze	No	Fingering, overlapping ends	Adornment or clothing accessory	Costume	Ring	Fingering
56	217	Ossarn	1984	69	9	Iron	No	Carving knife	Tool	Cutting	Knife	Carving knife type 1

Grave ID	Catalogue Nr.	Excavation Site	Year	Burial ID	Finding Nr.	Material	Decorated	Description	Category 1	Category 2	Category 3	Category 4
56	217	Ossarn	1984	69	10	Clay	Yes	Bowl, with omph.	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2a
56	217	Ossarn	1984	69	11	Clay	Unknown	Vessel fragment	Other	Vessel	Ceramic fragment	Small ceramic fragment
56	217	Ossarn	1984	69	12	Clay	Yes	Beaker, with omph.	Vessels and vessel implements	Drinking	Cups, tumblers and beaker	Beaker type Bs 1a
56	217	Ossarn	1984	69	13	Clay	Unknown	Upper vessel fragment	Other	Vessel	Ceramic fragment	Rim fragment
56	217	Ossarn	1984	69	14	Clay	Unknown	Lost vessel fragments	Other	Vessel	Lost vessel	Lost vessel
57	318	Ossarn	1984	- 4a		Clay	Unknown	Rim fragment	Vessels and vessel implements	Drinking	Bottles and Bottle like vessels	Bottle like vessel type Ho
57	318	Ossarn	1984	-	3	Bronze	Unknown	Small bronze ring	Other	Ring finger sized ring	Ring	Bronze Ring
57	318	Ossarn	1984	- 4b		Clay	Unknown	Vessel fragment	Other	Vessel	Ceramic fragment	Rim fragment
57	318	Ossarn	1984	-	5	Clay	Unknown	Vessel fragments	Other	Vessel	Ceramic fragment	Small ceramic fragment
58	219	Ossarn	1984	72 2a		Bronze	Yes	Fibula, type 'Vogelkopf', attached to small chain, broken tension	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
58	219	Ossarn	1984	72 2b		Bronze	Yes	Fibula, type 'Vogelkopf', attached to longer chain (Fnr. 2d)	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
58	219	Ossarn	1984	72 2c		Bronze	Yes	Fibula, type 'Vogelkopf', attached to longer chain (Fnr. 2d)	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
58	219	Ossarn	1984	72 2d		Bronze	No	Link chain at which fibula Fnr. 2b and 2c were attached to	Adornment or clothing accessory	Costume	Fibula	Fibula chain
58	219	Ossarn	1984	72	3	Bronze	Yes	Bracelet, hollow, embossed	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 5
58	219	Ossarn	1984	72	5	Iron	No	Box belt plaque	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
58	219	Ossarn	1984	72	7	Clay	Unknown	Lost bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw
58	219	Ossarn	1984	72	4	Bronze	Yes	Bracelet, hollow, embossed	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 5
59	220	Ossarn	1984	73	2	Bronze	Yes	Bracelet, twisted, loops at each end	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 7 open
59	220	Ossarn	1984	73	3	Iron	Yes	Fibula, type 'Vogelkopf', misses part of tension	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
59	220	Ossarn	1984	73	4	Bronze	Yes	Fibula, type 'Vogelkopf'	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
59	220	Ossarn	1984	73	5	Bronze	Yes	Fibula, type Certosa	Adornment or clothing accessory	Costume	Fibula	Wire Fibula, special variant
59	220	Ossarn	1984	73	6	Clay	Unknown	Lost vessel, in lists described as bottle like vessel	Vessels and vessel implements	Drinking	Bottles and Bottle like vessels	Bottle like vessel type Hu
59	220	Ossarn	1984	73	7	Clay	Unknown	Lost vessel, without description	Other	Vessel	Lost vessel	Lost vessel
60	22	Ossarn	1984	86	2	Clay	Unknown	Vessel, lost	Other	Vessel	Lost vessel	Lost vessel
60	22	Ossarn	1984	86	4	Unknown	Unknown	Box Belt Plaque, lost	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
61	23	Ossarn	1985	74	3	Clay	Unknown	Lost vessel	Other	Vessel	Lost vessel	Lost vessel
61	23	Ossarn	1985	74	4	Iron	Unknown	Unknown iron fragment	Unidentified object	unidentified object	unidentified object	unidentified object
62	228	Ossarn	1985	75	3	Iron	Unknown	Knife, lost	Tool	Cutting	Knife	Knife
62	228	Ossarn	1985	75 4a		Iron	Unknown	Ring, belt components, lost	Adornment or clothing accessory	Costume	Belt	Belt component
62	228	Ossarn	1985	75	5	Iron	Unknown	Bracelet, hollow, lost	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 5 lost
62	228	Ossarn	1985	75	6	Iron	Unknown	Bracelet, hollow, lost	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 5 lost
62	228	Ossarn	1985	75	7	Clay	Unknown	Small bowl, lost	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl type Bw
62	228	Ossarn	1985	75	8	Clay	Unknown	Larger Bowl, lost	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw
62	228	Ossarn	1985	75	9	Clay	Unknown	Bottle like vessel, lost	Vessels and vessel implements	Drinking	Bottles and Bottle like vessels	Bottle or bottle like vessel
62	228	Ossarn	1985	75	10	Clay	Unknown	Large vessel, lost, probably large storage	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho
62	228	Ossarn	1985	75	11	Clay	Unknown	Beaker small bowl hybrid, lost	Vessels and vessel implements	Drinking	Cups, tumblers and beaker	Beaker bowl hybrid
62	228	Ossarn	1985	75 4b		Iron	Unknown	Ring, belt components, lost	Adornment or clothing accessory	Costume	Belt	Belt component
63	268	Inzersdorf	1987	76	2	Iron	No	Spear head	Weapon	Offensive	Spear	Spear type 2
63	268	Inzersdorf	1987	76	3	Iron	No	Box belt plaque	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
63	268	Inzersdorf	1987	76	4	Iron	No	Approx. fingering sized ring	Adornment or clothing accessory	Costume	Belt	Belt component
63	268	Inzersdorf	1987	76	5	Iron	No	Knife	Tool	Cutting	Knife	Knife type 4
63	268	Inzersdorf	1987	76	7	Clay	Yes	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2a
63	268	Inzersdorf	1987	76	8	Clay	Unknown	Bowl, fragmented lower part	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 3v
64	270	Inzersdorf	1987	79	2	Iron	No	Javelin head	Weapon	Offensive	Spear	Spear type 2
64	270	Inzersdorf	1987	79	3	Iron	Yes	Open worked belt hook	Weapon	Costume (w)	Belt	Belt hook type 2
64	270	Inzersdorf	1987	79	4	Iron	No	'Koppelring', small	Weapon	Costume (w)	Belt	Koppelring
64	270	Inzersdorf	1987	79	5	Iron	No	'Koppelring', large	Weapon	Costume (w)	Belt	Koppelring
64	270	Inzersdorf	1987	79	6	Iron	No	Fragments, corroded, probably belt sheet fragments	Unidentified object	unidentified object	unidentified object	unidentified object
64	270	Inzersdorf	1987	79	7	Clay	No	Lower vessel fragment, probably pot or bottle like vessel	Other	Vessel	Ceramic fragment	Lower vessel part
64	270	Inzersdorf	1987	79	8	Clay	Yes	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 2
65	272	Inzersdorf	1987	80	2	Clay	Unknown	Biconical pot	Vessels and vessel implements	Storage and transport	Pots	Biconical pot type Ho 4a
65	272	Inzersdorf	1987	80	3	Clay	Yes	Small bowl, with omph.	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl type Bw 2a
65	272	Inzersdorf	1987	80	4	Clay	Yes	Bowl, with omph.	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2a
65	272	Inzersdorf	1987	80	5	Clay	Unknown	Vessel, base fragment	Other	Vessel	Ceramic fragment	Base fragment
65	272	Inzersdorf	1987	80	6	Iron	No	Carving knife	Tool	Cutting	Knife	Carving knife type 1
66	277	Inzersdorf	1987	82	2	Bronze	Yes	Fibula, type 'Vogelkopf'	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
66	277	Inzersdorf	1987	82	3	Iron	Yes	Fibula, special variant of type Certosa	Adornment or clothing accessory	Costume	Fibula	Fibula type Certosa, special variant
66	277	Inzersdorf	1987	82	4	Iron	Yes	Spear, with long spout, rhombic blade	Weapon	Offensive	Spear	Spear type 1
66	277	Inzersdorf	1987	82	5	Iron	Yes	Needle, with handle plate, bronze rivet	Tool	Perforating	Needle	Needle
66	277	Inzersdorf	1987	82	6	Iron	Yes	Butt spike of spear (Fnr. 4)	Weapon	Offensive	Spear	Spear ferrule
66	277	Inzersdorf	1987	82 7a		Clay	Yes	Large Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 4a
66	277	Inzersdorf	1987	82 7b		Clay	Yes	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 2

Grave ID	Catalogue Nr.	Excavation Site	Year	Burial ID	Finding Nr.	Material	Decorated	Description	Category 1	Category 2	Category 3	Category 4
66	277	Inzersdorf	1987	82	8	Clay	Yes	Small pot	Vessels and vessel implements	Storage and transport	Small Pots	Small pot type Bs 2
66	277	Inzersdorf	1987	82	9	Clay	Yes	Bowl, with omph.	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2a
66	277	Inzersdorf	1987	82	11	Iron	No	Carving knife	Tool	Cutting	Knife	Carving knife type 1
66	277	Inzersdorf	1987	82	13	Clay	No	Small bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2a
66	277	Inzersdorf	1987	82	14	Iron	No	Box belt plaque fragment	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
67	279	Inzersdorf	1987	83	2	Iron	No	Spear head	Weapon	Offensive	Spear	Spear type 2
67	279	Inzersdorf	1987	83	3	Iron	No	Javelin head	Weapon	Offensive	Javelin	Javelin type 2
67	279	Inzersdorf	1987	83	4a	Iron	No	Two small rings, open, part of former belt	Adornment or clothing accessory	Costume	Belt	Belt component
67	279	Inzersdorf	1987	83	4b	Iron	No	Rivet, part of former belt	Adornment or clothing accessory	Costume	Belt	Belt component
67	279	Inzersdorf	1987	83	5	Iron	No	Box belt plaque	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
67	279	Inzersdorf	1987	83	6	Iron	Yes	Finger nail clipper, cleaner, handle partly out of amber and bronze	Adornment or clothing accessory	Toiletry	Nail Clipper	Nail clipper
67	279	Inzersdorf	1987	83	7	Iron	No	Small ring, open	Other	Ring finger sized ring	Ring	Iron ring
67	279	Inzersdorf	1987	83	8	Clay	Unknown	Vessel, lower vessel part	Other	Vessel	Ceramic fragment	Lower vessel part
67	279	Inzersdorf	1987	83	9	Clay	Yes	Bowl, with omph.	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2a
67	279	Inzersdorf	1987	83	10	Clay	Unknown	Vessel, base fragment	Other	Vessel	Ceramic fragment	Base fragment
67	279	Inzersdorf	1987	83	11	Iron	No	Carving knife	Tool	Cutting	Knife	Carving knife type 1
67	279	Inzersdorf	1987	83	14	Bronze	No	Small ring, outline oval	Other	Ring finger sized ring	Ring	Bronze Ring
67	279	Inzersdorf	1987	83	15	Clay	Yes	Small bowl	Vessels and vessel implements	Drinking	Cups, tumblers and beaker	Beaker type Bs 1a
67	279	Inzersdorf	1987	83	16	Iron	No	Small ribbon-like, partly bend iron fragments	Unidentified object	unidentified object	unidentified object	unidentified object
68	282	Inzersdorf	1987	-	2	Bronze	Yes	Fibula, type 'Vogelkopf'	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
68	282	Inzersdorf	1987	-	3	Bronze	Yes	Dress pin	Adornment or clothing accessory	Costume	Dress pin	Dress pin type 1
68	282	Inzersdorf	1987	-	4	Iron	No	Nail clipper, cleaner	Adornment or clothing accessory	Toiletry	Nail Clipper	Nail clipper
69	284	Inzersdorf	1987	87	2	Iron	No	Javelin head	Weapon	Offensive	Javelin	Javelin type 2
69	284	Inzersdorf	1987	87	3	Iron	No	Javelin head	Weapon	Offensive	Javelin	Javelin type 2
69	284	Inzersdorf	1987	87	4	Iron	No	Javelin head	Weapon	Offensive	Javelin	Javelin type 2
69	284	Inzersdorf	1987	87	5	Iron	No	Ring, open	Adornment or clothing accessory	Costume	Belt	Belt component
69	284	Inzersdorf	1987	87	6	Iron	Yes	Fibula, type Certosa	Adornment or clothing accessory	Costume	Fibula	Certosa Fibula
69	284	Inzersdorf	1987	87	7	Clay	No	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 4
69	284	Inzersdorf	1987	87	8	Clay	Yes	Bowl, with omph.	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2a
70	285	Inzersdorf	1987	88	2	Iron	Yes	Fibula, type Marzabotta, with bird head decoration	Adornment or clothing accessory	Costume	Fibula	Fibula type Marzabotto
70	285	Inzersdorf	1987	88	3	Clay	Yes	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 3a
70	285	Inzersdorf	1987	88	4	Clay	Yes	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2a
70	285	Inzersdorf	1987	88	5	Clay	Unknown	Vessel base fragment of a larger vessel	Other	Vessel	Ceramic fragment	Base fragment
71	287	Inzersdorf	1987	89	2	Bronze	Yes	Bracelet, corrugated/ ripped decorated, closed	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 6
71	287	Inzersdorf	1987	89	3	Bronze	Yes	Bracelet, corrugated/ ripped decorated, closed	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 6
71	287	Inzersdorf	1987	89	4	Clay	No	Pot	Vessels and vessel implements	Storage and transport	Small Pots	Small pot type Bs 3
72	288	Inzersdorf	1987	90	2	Iron	No	Box belt plaque	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
72	288	Inzersdorf	1987	90	3	Clay	No	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot
72	288	Inzersdorf	1987	90	4	Clay	Yes	Bowl, with omph.	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2a
72	288	Inzersdorf	1987	90	5	Clay	Unknown	Lower vessel fragment	Other	Vessel	Ceramic fragment	Lower vessel part
72	288	Inzersdorf	1987	90	6	Clay	Yes	Beaker, with omph.	Vessels and vessel implements	Drinking	Cups, tumblers and beaker	Beaker type Hu 1a
72	288	Inzersdorf	1987	90	8	Unknown	No	Bead, unknown material, corroded	Adornment or clothing accessory	Costume	Bead necklace	Bead
72	288	Inzersdorf	1987	90	9	Unknown	No	Bead, same unknown material as Fnr. 8	Adornment or clothing accessory	Costume	Bead necklace	Bead
73	289	Inzersdorf	1987	91	2	Bronze	Yes	Fibula, type 'Vogelkopf'	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel
73	289	Inzersdorf	1987	91	3	Glass	Yes	Glass bead, blue	Adornment or clothing accessory	Costume	Bead necklace	Glass bead
73	289	Inzersdorf	1987	91	4	Glass	Yes	Glass bead, blue	Adornment or clothing accessory	Costume	Bead necklace	Glass bead
73	289	Inzersdorf	1987	91	5	Iron	No	Box belt plaque, fragmented	Adornment or clothing accessory	Costume	Belt	Belt hook type 1
73	289	Inzersdorf	1987	91	6	Iron	No	Large hollow ring	Adornment or clothing accessory	Costume	Belt	Belt component
73	289	Inzersdorf	1987	91	7	Clay	Yes	Pot	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 3
73	289	Inzersdorf	1987	91	8	Clay	Unknown	Bowl	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2v
73	289	Inzersdorf	1987	91	9	Clay	Yes	Bowl, with omph.	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 1
73	289	Inzersdorf	1987	91	10	Clay	Yes	Small bowl, with omph.	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl type Bw 1
74	320	Inzersdorf	1987	92	3	Bronze	Unknown	Fibula, fragmented, probably wire fibula	Adornment or clothing accessory	Costume	Fibula	Fibula fragment
74	320	Inzersdorf	1987	92	3	Bronze	No	Bracelet	Adornment or clothing accessory	Costume	Bracelet	Bracelet type 4
74	320	Inzersdorf	1987	92	4	Clay	Yes	Bottle like vessel, biconical	Vessels and vessel implements	Drinking	Bottles and Bottle like vessels	Bottle like vessel type Hu 1h
74	320	Inzersdorf	1987	92	5	Clay	Yes	Bottle like vessel	Vessels and vessel implements	Drinking	Bottles and Bottle like vessels	Bottle like vessel type Hu 1a
74	320	Inzersdorf	1987	92	6	Clay	Yes	Small bowl, with omph	Vessels and vessel implements	Drinking	Bowls and porringers	Small bowl type Bw 1
74	320	Inzersdorf	1987	92	7	Clay	Yes	Bowl, with omph.	Vessels and vessel implements	Eating and cooking	Bowls and porringers	Bowl type Bw 2a
74	320	Inzersdorf	1987	92	8	Clay	Yes	Pot, situla like	Vessels and vessel implements	Storage and transport	Pots	Pot type Ho 2
74	320	Inzersdorf	1987	92	9	Bronze	Yes	Fibula, type 'Vogelkopf'	Adornment or clothing accessory	Costume	Fibula	Vogelkopffibel