Making a Mark—Towards a Graffiti Thesaurus

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Abstract

What does it mean to create graffiti? What exactly is (or are) graffiti? Graffiti and street art differ, right? Almost everyone has an opinion on what constitutes (modern) graffiti. Consequently, the term has taken on the most varied meanings in the conversations of academics, in media coverage, or in daily life. So how can one be sure about the meaning of the term (or any graffiti-related term, for that matter)? This is why glossaries, dictionaries, and other types of lists with definitions exist on websites, at the beginning or end of coffee-table books, and in scientific articles. However, there is currently no generally available, updateable, broadly accepted and easy-to-expand list of graffiti-related terms. Therefore, in order to meet the need for systematisation and consistency required for a more comprehensive study of graffiti, project INDIGO embarked on the journey to create a graffiti thesaurus. Being a finite set of terms (i.e. a controlled vocabulary) with hierarchical relations, this thesaurus will make INDIGO's graffiti classification explicit and hopes to serve as a reference for the broader (academic) graffiti community.

1. Introduction

In their current vibrant form and practice, modern graffiti appeared in the 1960s on the East Coast of the USA in cities like Boston, Philadelphia, and New York City (Papenbrock & Tophinke, 2016; Castleman, 1982; Chalfant & Prigoff, 1987). From there, they slowly conquered the world through different channels. Novak (2017) identifies three factors that influenced this global spread, the first one being gallery exhibitions, which impacted graffiti practices in the USA and Western Europe throughout the 1980s. The second one—cultural media—had an even stronger influence and included films like *Wild Style* (1983), *Beat Street* (1984) and *Style Wars* (1983), but also books like *Subway Art* (1984) and *Spraycan Art* (1987) and zines like *International Graffiti Times*, *Can Control*, and *Flashbacks*. Both factors spurred younger adults to imitate these activities around the globe in their hometowns, which Novak (2017) counts as interpersonal contact and presents as the third factor that helped spread graffiti globally.

However, scholarly interest in graffiti existed long before this modern graffiti revival. For Roman graffiti, research started as early as the 1840s, focusing on the graffitied architecture of archaeological sites like Pompeii (Avellino, 1841). Since then, coverage of various graffiti types has increasingly seeped into the scholarly literature, from religious rock graffiti in Egypt (Wiedemann, 1900) and scribbles found in toilet stalls at bars and cafés (Dundes, 1966) to scratchings on trees (Mallea-Olaetxe, 2010) and medi-

eval church graffiti (Champion, 2015). Due to this mix of research topics—each with its history and characteristics—and the generalised use of 'graffiti' to refer to both ancient and contemporary artefacts, the term became increasingly ill-defined but used throughout different research fields. The rise of street art and many other inventive forms of mark-making created by humans only compounded this fuzziness.

Although strict definitions risk isolating any academic subject from other research fields, the authors believe it is a necessary challenge for any field to properly delineate the subject of its scholarly activities and to reflect on what terms are used to indicate the objects and concepts relevant to the domain under consideration. In the framework of graffiti research, a more standardised vocabulary would also enable analysis on a larger-than-local scale. For example, suppose *database A* labels a creation 'graffito', while *database B* considers the same work as 'street art'. In that case, cross-database queries would lead to partial results and conflicts. And even if multiple people enter data into the same database, the fact that they might be using different personal definitions for the same terms could render that database unusable. To avoid the inaccurate, biased or even impossible analysis that stems from too much terminological elasticity, the academic project INDIGO (see Verhoeven et al., 2022) decided to create a broad, graffiti-centric thesaurus of well-defined terms.

Before section 3 explains the concept of a thesaurus via exploring existing attempts to organise or describe graffiti terminology, this text starts with the definitional issues concerning the term 'graffiti'. Properly defining the thesaurus' umbrella term 'graffiti' is essential to guide the inclusion of other terms and decide on their inter-terminological relationships. This structuring phase of the thesaurus—including the implications of certain decisions—is examined in section 4, along with the implementation of the thesaurus into a semantic framework.

2. This Text Is Not a Graffito. What Are Graffiti?

Is an "I love you" scratching on a tree bark a graffito? Are prehistoric cave paintings graffiti? Why do we denote the colourful writing of one's name on a train and the ancient Graeco-Roman wall scribblings as graffiti but refrain from using this label for geoglyphs like the Nazca lines or rock en-

gravings? The term 'graffiti' gets used relatively arbitrarily, and there seems to be no ruleset to define what does and does not classify as graffiti.

2.1. A Short Historical View

To start our search for more clarity, it pays dividends to check the history of the term 'graffiti' and how its meaning might have fluctuated over time. As far as the authors are aware, the term 'graffito' (the singular form of 'graffiti') and the related term 'sgraffito' (with an intensive prefix 's-') were already used in an art-technical context as early as 1550, when the first edition of Giorgio Vasari's *Vite* was published (Vasari, 1550). In chapter 26 of the theoretical part of this work (Vasari, 1550, vol. 1, p. 90–91; contained in the section *De la pittura*), Vasari describes a technique commonly used to decorate the walls of buildings. He calls it 'sgraffito' (vol. 1, p. 90) and explicitly derives it from the verb 'graffiare' (i.e., 'to scratch'; mentioned in this passage in its past participle form 'graffiato': vol. 1, p. 91). In other sections of his work, he also uses the term 'graffito' (Vasari, 1550, vol. 2, p. 816: in the lives of *Polidoro da Caravaggio et Maturino Fiorentino*). Although this first written record originates in Renaissance Italy, the decoration technique likely has an earlier beginning, as evidenced by the numerous decorated walls from the 13th century present in the former archdiocese of Magdeburg/Sachsen-Anhalt (Danzl & Möwald, 2019).

Three basic steps constitute the '(s)graffito' technique, as also described by Lamb (1999). First, a coloured plaster (often of a darker hue) is applied as a base on a wall and left to dry. Subsequently, another layer of plaster with a contrasting colour to the first layer is added. Using a metal tool, decorative ornaments are scratched into the top layer, revealing the differently coloured layer underneath.

Therefore, what Vasari mentions as '(s)graffito' is a very specific technique, which—from a technical point of view—has very little in common with the typical modes of production of contemporary graffiti. However, Vasari's work still retains crucial value for analysing and understanding the subsequent evolution of the term '(s)graffito' in light of the more recent developments in contemporary culture.

First, Vasari's *Vite* already testifies to the multiplicity and variety of terminology that will be found in later centuries. Vasari (1550)—in addition to 'graffito', 'sgraffito', and the

verb 'graffiare'—mentions the verb 'sgraffire' (vol. 1, p. 12: in the proem to the whole work), 'graffi' (vol. 1, p. 91: in *De la pittura*, chapter 26; referring to the 'scratches' made by iron tools), 'sgraffiare' (vol. 1, p. 409: in the life of *Andrea da 'l Castagno di Mugello*; referring to more casual sketches made by the artist in young age). And, most importantly, one can already notice the use of the plural form 'graffiti' (vol. 2, p. 818: in the lives of *Polidoro da Caravaggio et Maturino Fiorentino*) or 'sgraffiti' (vol. 1, p. 90: in the heading of chapter 26), which indicates individual artefacts resulting from the application of the technique. Most of these terms can be found, for example, in the *Dizionario tecnico dell'architetto e dell'ingegnere civile ed agronomo* compiled by the Collegio degli architetti ed ingegneri di Firenze towards the end of the 19th century (1883, p. 501, where you can find entries for 'graffio' and 'graffito'; 1884, p. 375: entries for 'graffire', 'sgraffio', 'sgraffito', and 'sgraffire'; see also Danzl & Möwald, 2019, p. 91 note 4 for further references to 'graffiti' in art-technical dictionaries).

Secondly, we might also find in Vasari a hint as to how a very specialised art-technical term, which referred to a procedure outlined in well-defined steps, could be applied, as we shall see below, to the phenomenon of contemporary 'graffiti'. Vasari himself (1550, vol. 1, p. 91) identifies a characteristic that makes 'graffiti' different from artefacts created with other techniques: they are exclusively intended for use on the external surfaces of buildings, particularly the facades of houses and palaces. This is due to the relatively short time it takes to make them and their durability, which renders them waterproof.

A close connection is thus established between 'graffiti' and execution on a wall, or rather on an external surface that does not have the main function of presenting a work of art but rather the more practical one of enclosing a building and possibly keeping it standing. These surfaces can often be identified as 'communal' surfaces since they are part of a building intended for use by a community (although the community might also be a rather narrow one), or at least they are accessible and visible to everyone. This direct link between 'graffiti' and walls represents the common term that binds together the graffito productions considered by Vasari, and many of the contemporary artefacts typically referred to as 'graffiti'. We cannot be sure how much the traditional use of the term in its art-technical meaning

contributed to its reuse and adaptation in the 20th century. However, the fact that the oldest graffiti were also executed on walls might have prompted some modern interpreters of the phenomenon that was taking shape in American cities in the late 1960s and 1970s to borrow (as we shall see) a term such as 'graffiti', coming from a specialised art-technical lexicon.

After all, over the centuries the term had also begun to be employed to denote artefacts other than the graffiti of Renaissance Italy. More specifically, it was used by Avellino (1841) and Garrucci (1856) to indicate the inscriptions archaeologically attested on the walls of Roman Pompeii. In the anonymous text "The Graffiti of Pompeii", written three years after Garrucci's book, the author equates graffiti to "street-scribblings" made either with a pointed instrument or possibly also with charcoal or red chalk (S.n., 1859, p. 416). The author also notes the difficulty of finding an equivalent English word for 'graffiti'. And since the French adopted it *verbatim*, he or she resorts to using it throughout the text, thereby likely introducing it into the English language.

However, the current standard use of the term 'graffiti' no longer exclusively refers to marking walls with either chalk and charcoal or a sharp object. In everyday language, creating graffiti also implies the usage of different materials like paint or ink on various surfaces such as waste bins and trains. Many of these connotations date back to the 1971 *New York Times* newspaper article "'Taki 183' Spawns Pen Pals" (S.n., 1971), in which the tags of TAKI 183 are called 'graffiti'. However, the term did not initially find acceptance among the practitioners, who referred to their sprayed tags as 'writing' (Castleman, 1982). This becomes also very clear from a comment by *micoaslatinpride* on Schutz's (2014) blog post "Jack Stewart and the documentation of early graffiti writing": "Those of us who were there, DID NOT call what we did "graffiti." Instead, we referred to what we did as "writin' ", which is the reason why we called ourselves "Writers".... Writers who wrote our names." The American graffiti creators of the 1970s wrote on walls, so they perceived themselves as 'writers'. This basically means writing one's name, the crew's name or a moniker on a wall or anywhere in a public space (Papenbrock & Tophinke, 2016).

Knowledge of all this material, such as the texts by Vasari or the exploits by TAKI 183 and his tagging colleagues,

prompts us to ask the question: Should the term 'graffiti', both in its ancient and contemporary connotations, solely refer to mark-making on urban surfaces like walls and train carriages, or can other surfaces also be graffitied? Do graffiti have to be created in public space, or can they be practised in private areas? Can 'graffiti' be considered a child of a broader concept, or is 'graffiti' the most comprehensive term possible? And what about 'writing' or a term like 'street art'? Should we consider only illegal and unsanctioned creations as 'graffiti', leaving other designations for authorised or commissioned works? Trying to solve these questions has not been an easy undertaking, and it is something project INDIGO is still continuously working on. However, we have come to agree on various aspects and characteristics of graffiti. Although those are detailed in sections 2.2 and 2.3, it does not mean they are set in stone. Every book, every video, and every blog post with graffiti-related content consulted by the INDIGO team has the potential to challenge our notions.

2.2. Singular and Plural

The Italian word 'graffiti' is plural, with 'graffito' being the singular form. Strictly following its first written mention in the work of Vasari, one should thus write "graffiti are" and "a graffito is". In the 1980s and 1990s, the word 'graffiti' became increasingly used as a singular noun. Since most English plurals end with an '-s', treating 'graffiti' as singular can be considered in accordance with the normal evolution of the English language (Aitchison, 1997). However, to facilitate a proper distinction between one and more 'creations', we keep on using the singular 'graffito' and plural 'graffiti' (as was common in the early literature, e.g., Černý, 1947; Gustafsson, 1956; Habachi, 1957; Landy & Steele, 1967; Woolner, 1957).

2.3. A Triple Concept

Graffiti are a form of mark-making in which "all marks are material signs in the basic sense of an index: they signify the action or movement (intentional or unintentional) that produced them" (Malafouris, 2021, p. 99). But since mark-making includes everything from one's fingerprints to a dog barking in its owner's garden, it is essential to define clear characteristics that can narrow down mark-making, so it only includes graffiti. For instance, not many would

debate that graffiti are a form of human mark-making (or human-made marks). However, which other distinct properties do graffiti possess? A present-day, illegally spayed mural is often considered a form of graffiti. But does that view change when one knows this mural has been commissioned? If so, then legality is a limiting characteristic for graffiti. But if not, how does a medieval fresco differ from such a commissioned graffito? Of course, they might vary in technique, but only the former is typically considered valuable and denoted as 'cultural heritage'. But what, apart from 'age' and 'appreciation', are the criteria to separate these two legal, visual expressions on a wall? Although age is commonly relied on as a criterion of significance, INDIGO refrains from such a measure, which it considers ill-founded and personalised, because it prevents the build-up of a well-defined, individual-independent terminological hierarchy. Using the same logic, INDIGO omits nouns like 'art' and 'artist' or properties like 'arty', as they only make sense in the eye of the beholder.

After embarking on this academic quest for a suitable categorisation, the authors realised that graffiti is a multi-faceted term that changes meaning depending on its use. One year into project INDIGO, the authors consider 'graffiti' to be a term with three possible connotations:

• graffiti as activity, referring to "the creation of a mark".
• graffiti as objects (graffito as object), referring to "the mark resulting from graffiti as activity".
• graffiti as style, referring to "the mark looking like graffiti writing".

Let us start with the former. Narrowing-down 'mark-making' so that it only refers to 'graffiti as activity' can, according to the authors, only work if:

• mark-making is performed by a human (or multiple humans), thus excluding animals. Marking could be done by robots, as they are considered a tool used to create a mark (that is, as long as sentient artificial intelligence is still fiction).
• mark-making is done on purpose, ruling out the accidental creation of fingerprints or mark-making from walking on a dusty floor.

- mark-making constitutes a visual intervention, ruling out other sensory mark-making like the sound of an ambulance's siren, shouting "help", or farting.
- mark-making takes place in the real world, excluding mark-making in digital environments, virtual reality worlds, or the metaverse.
- mark-making takes place on or through all possible public, communal or private surfaces, like the building walls around a town square, waste bins, tables, trees, rocks, cars, the toilet of a local football club, bones, human and animal skin. Mark-making cannot take place on private surfaces visible only to the creator, since mark-making amounts to the generation of a visual exchange—which is impossible in isolation.
- mark-making involves appropriating a surface (i.e., the adoption of a surface as a canvas despite the fact that it was not originally meant to be one), ruling out mark-making like drawing on paper or oil painting on canvas.
- mark-making can be done in different ways, using either additive techniques (like painting, spraying or covering surfaces with knitted creations) or reductive techniques (such as incising, picking, carving or abrading).

In other words, 'graffiti as activity' can be defined as *the act whereby a human (or a group of humans) uses one or more ways to purposely make a visual intervention on any real-world, appropriated surface that is not just visible to the creator*. 'Buffing' and 'bombing' can then become possible subconcepts of 'graffiti as activity'. The result of that activity is a 'graffito as object', which has the same characteristics as the activity:

- the mark is anthropogenic, ruling out animal marks.
- the mark has a purpose, ruling out casual lip prints on a wine glass. Of course, purposes can range from entertaining a child, declaring love, damaging property, and creating something beautiful. Although defining the purpose or the intentionality of the mark is often impossible and a matter of interpretation, this issue does not apply to the definition but solely to the uncertainty of classifying something as purposeful mark-making.
- the mark is a visual intervention, ruling out marks that rely purely on sound, smell, or touch.

- the mark is a real-world analogue entity, ruling out a digital location pin in Google Maps or a tag digitally sprayed in an online game.
- the mark is on or through any possible surface, except a private surface only accessible to the mark-maker, because the mark is always a personal and visual statement, and a statement needs a human receiver.
- the mark is found on or through an appropriated surface, ruling out notebook sketches, a billboard, or a manifesto on papyrus.
- the mark can be made in different styles with various techniques, ruling out graffiti writing or sgraffiti (made by scratching) as the only valid graffiti forms.

Even though these rules apply to (what we consider) the different types of 'graffito as object' (writing, street art, symbols, and verbal graffiti), our definition still needs fine-tuning. The examples in Figure 1 illustrate this.

If we include marks made for purely practical reasons, whitewashing tree trunks (Figure 1A) to minimise insect damage and sunscald would be 'graffiti as activity'. By the same logic, plastic ear tags (Figure 1B) or firebrands to identify livestock ownership would render it 'graffito as object'. Suppose we stipulate that graffiti (as activity and objects) cannot be merely practical. In that case, the definition might exclude *tituli picti* (i.e., the ancient Roman commercial marks painted on the outer surface of amphorae; Figure 1C) or the phallus engravings in Roman cities indicating brothels. This highlights that our features for differentiating 'graffiti' from all other mark-making practices and results have yet to be refined, but also suggests that most descriptions of 'graffiti' are generally too vague. The commonly cited definition by Ross makes this clear:

"graffiti typically refers to words, figures, and images that have been drawn, marked, scratched, etched, sprayed, painted, and/or written on surfaces where the owner of the property (whether public or private) has NOT given permission to the perpetrator." (Ross, 2016, p. 1)
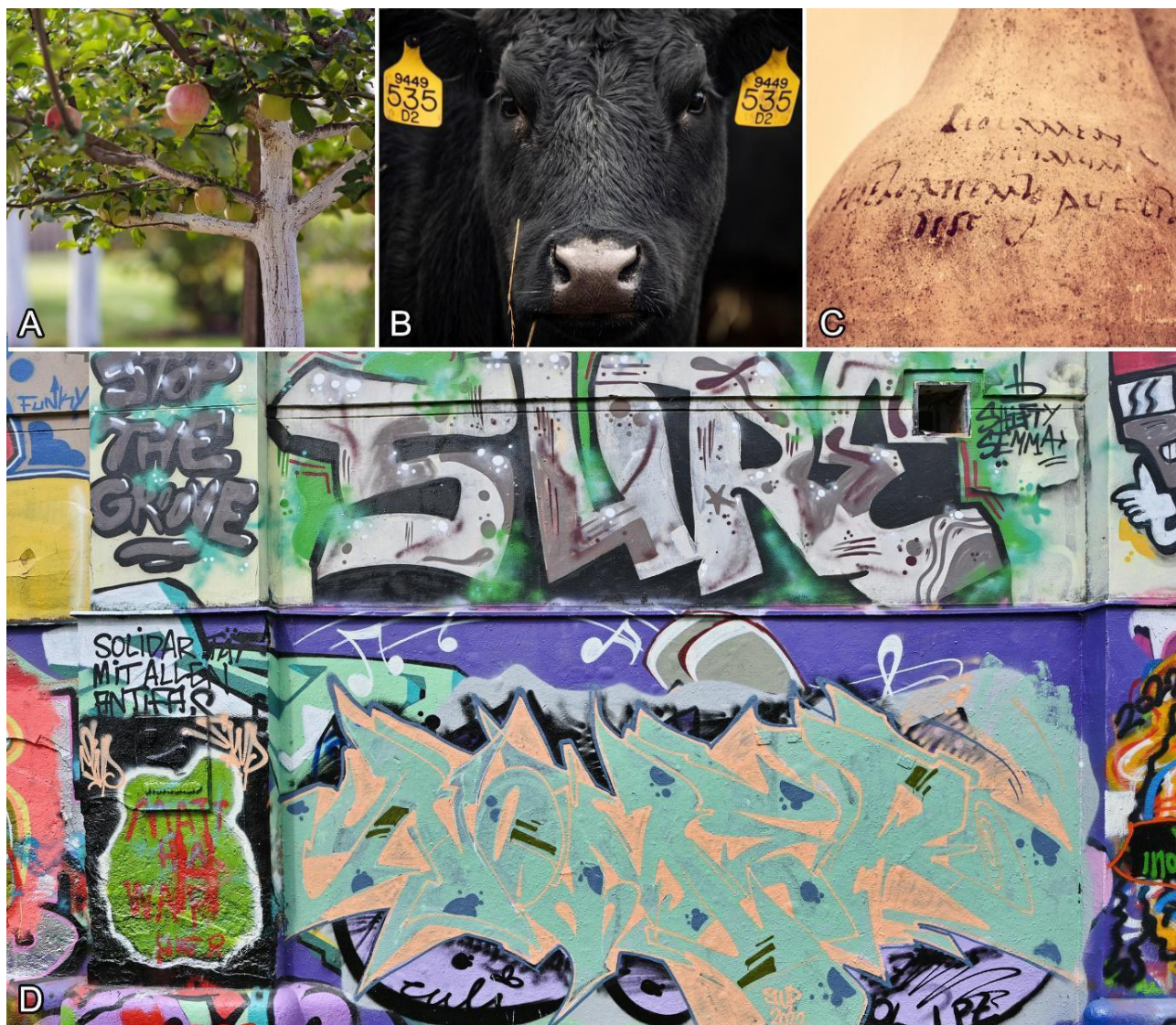
Figure 1. Four distinct mark-making results: A) white-painted tree barks; B) plastic tags to identify livestock ownership; C) a *titulus pictus* on the neck of an amphora for fermented fish sauce (photograph by Dr. Sophie Hay); D) graffiti created on one of Vienna's legal walls.

The word 'typically' invites personal opinion and randomness, opening the door to include whatever one might (not) find appropriate. If we leave out the word 'typically', the tag made by a lady on the outside wall of her house is not considered a graffito. If one scratches an animal on a tree or a rock, this definition does not consider the mark to be a graffito. And what about graffiti created on a legal wall? This last example indicates that the often perpetuated no-

tion that "all graffiti are illegal" no longer works as a characteristic and defining property of graffiti. Very often, graffiti have been approved explicitly by law or implicitly through easements (Cloon, 2016), making them either legal or unapproved but not illegal. In Vienna, 22 legal (sections of) walls form the 'Wienerwand' (Eng. 'Viennese wall'), a joint label given to all these legal graffiti surfaces in the city (see https://www.wienerwand.at). Therefore, excluding the

marks depicted in Figure 1D from the category of 'graffiti as objects' would be incorrect in the authors' opinion and no longer be in line with the tendencies that have appeared worldwide in the last two decades. In addition, limiting graffiti on the basis of their legality would rule out most of the marks studied by archaeologists (and those marks were referred to as 'graffiti' long before the same label was given to more recent creations, as explained above).

Creating a thesaurus implies that all terms must be clearly defined and the decision-making criteria made explicit. Since this has proven to be more difficult than initially thought, the authors welcome any constructive input on this matter, also regarding the concept of 'graffiti as style', which we reserve for cases where the mark looks like graffiti writing. Although the 'graffiti as activity' concept stipulates that marks can be made with various techniques in different styles (such as graffiti writing, symbols, verbal graffiti, and street art), it must be possible for something to be labelled 'graffiti as style' although it did not result from 'graffiti as activity'. A good example would be a drawing on a piece of paper. Drawing on paper cannot be considered 'graffiti as activity', and the result is not a 'graffito as object'. However, the drawing can be reminiscent or imitate tags made in the street that do classify as 'graffiti as objects'. And this 'looking like' can only be undeniably established in relation to graffiti writing, whether satiric, humorous, obscene, or gang related.

2.4. The Proof of the Pudding Is in the Eating

Let us now consider a few examples to clarify the categorisation outlined above. The following are some edge cases that serve to illustrate the unlikelihood of finding a perfectly binary graffiti classification scheme.

- In a black book, creators often sketch the piece or mural they will later create on a real-world public or communal surface. These books are private objects; they are sometimes exchanged between creators, but cannot be defined outright as communal or public surfaces. This highlights the fuzziness in defining a private surface. The sketching takes place on paper, which excludes them automatically from 'graffiti as objects', although some of them might still meet the requirements to be categorised as 'graffiti as style'. Nailing that black book

onto a tree would turn it into a public mark and qualify as 'street art' or 'landscape art' for most people. The exact definition of these terms is still being worked out within INDIGO.

- A facial tattoo is a mark that fulfils both surface criteria. It sits on an appropriated surface, and the face is not just visible to the tattooed person. As such, it qualifies for 'graffito as object'. However, a tattoo on private parts is an edge case. Although the tattooer saw the surface, it might later solely be visible to the person having that tattoo—but the tattooed private parts of a prostitute might be accessible or used for public or communal purposes.

- Can the act of creating a large painting in a locked, desolate building be considered 'graffiti as activity'? At the time the painting is created, the surfaces of the building do not have public or communal use. Still, the question is if the inner building walls can be considered private. Assuming nobody enters that building any longer, it is not wrong to consider the painting as a mark on a private surface only accessible to the mark-maker. However, as soon as a second person enters the building, the painting fulfils its visual exchange function, turning into a 'graffito as object'. This also showcases that 'graffiti as activity' and 'graffito as object' can be both legal and illegal, sanctioned and unsanctioned, thereby invalidating the still often encountered statement of graffiti being an unauthorised act.

- A tree on a private property gets covered with colourful, knitted garments after somebody climbs over the property-surrounding fence. Despite being privately owned, the tree's bark is an appropriated surface not just accessible to the mark-maker, which makes this knitted creation a valid example of 'graffito as object'. Sometimes, this type of graffiti is also called 'kniffiti'.

- Mark-making in one's bedroom is an edge case for 'graffiti as activity' because it is hard to establish in what sense this could be a visual exchange. The latter observation might also prevent the mark from being a 'graffito as object'. However, if that wall were removed from the house and included in a large new shopping centre, the same surface would change its status, thereby changing the mark's categorisation to 'graffito as object'. If the mark were a self-portrait in 17th-century Dutch style,

however, it would still not be 'graffiti as style'.

- A shirt with a print of a Pompeian graffito or a famous Banksy creation is none of the three 'graffiti' concepts. The textile might show a 'graffito as object', but it is a derivative which does not classify as 'graffiti as style'.

- The Dutch Theo Brandwijk is known for peeing eagle-shaped marks on walls (https://www.mediamatic.net/en/page/87561/theo-brandwijk-eagle). As he 'works' in public space and creates on purpose a visual mark on an appropriated surface, the creating is 'graffiti as activity' and the outcome a 'graffito as object'.

- A man defecates on the streets. Although this act has a purpose and creates a visual intervention on a real-world public surface in a distinctive style, most people would never accept this to be a graffito as object, activity, or style. However, some could consider it street art (which INDIGO considers to be a sub-concept of graffiti). This conflict highlights that odd human-made markings might be considered graffiti; otherwise, one would need to establish an unquantifiable 'in the eye of the beholder' property. In that sense, (some) graffiti can be similar to art. Nobody considered a urinal to be art until the French artist Marcel Duchamp shocked the world in 1917 with his signed and dated urinal titled *Fountain*. Nevertheless—and as mentioned before—, project INDIGO prefers not to use the nouns 'artist' and 'art' (as in 'graffiti art(ist)') or the adjective 'arty' with graffiti, because they carry too much subjectivity to describe graffiti.

The urge of people to leave a mark wherever they go is as old as humanity itself. Prehistoric rock paintings, inscriptions on Greek and Roman ceramics, scratches in medieval church walls and all variants of modern graffiti: from scribbles on the bus shelter windows and tall murals for advertisements to chalk mandala drawings on the pavement and yarn-bombed statues. INDIGO's triple approach to the concept 'graffiti' makes it now possible to identify and categorise what should be, or cannot be, included in a thesaurus on graffiti (although some fine-tuning is still needed). The next section will explore the world of knowledge organisation systems to grasp the need for, as well as the scope and the limits of, a thesaurus.

3. Knowledge Organisation System

'Knowledge Organisation System' (KOS) is a term that can be used broadly to define a discipline's models or theories that structure information and knowledge. However, even more often, KOS refers to a kind of scheme that helps organise data and retrieve information and knowledge. Some of these KOSs are called 'controlled' or 'uncontrolled vocabularies' (but not all KOSs belong to one of these two categories).

To understand some of the important KOS principles and terminology, it pays off to delve deeper into the world of knowledge organisation and controlled vocabularies. Both are generally used in museums, libraries and archival settings. However, this paper focuses explicitly on the domain of graffiti (and by extension all human-made marking terminology).

3.1. Controlled Vocabulary

Controlled vocabularies enforce the idea that only a limited set of terms, names or phrases, collectively called 'concepts', can be used to describe and look for data, information or knowledge in a given system. The concept is described in ISO 25964-1:2011 as a "unit of thought" (International Organization for Standardization, 2011, p. 3; see also Figure 2 left). A single concept can be expressed by more than one term, and a single term can express more than one concept. Terms can change over time, take various forms, and be translated into many languages (Aitchison et al., 2000). If a list with terms, names or phrases claims that "one can only use these concepts", it is a controlled vocabulary, as it establishes control over the concepts that get used.

Creating, maintaining, and using a controlled vocabulary is denoted 'vocabulary control'. A controlled vocabulary represents and describes a specific domain or has a defined scope (for example, analysing graffiti or describing medieval castles). This list can be organised in alphabetical order (but need not be) and should enable browsing and searching through that list. Some controlled vocabularies are structured vocabularies, meaning they record the hierarchical (e.g., 'graffito' is subordinate to 'human-made making') and equivalence or preferential relations between the concepts (Harpring, 2013). The preferential relations control the links between synonymous terms or lexical variants for the

same concept and indicate the preferred term. For example, an inexperienced graffiti writer could be called 'toy' or 'beginner', while orange can be considered a 'colour' or a 'color'. Selecting 'toy' and 'colour' as the favourite terms—and doing the same for any other vocabulary concept—supports consistency in their use. When all spelling variations, antonyms, synonyms and abbreviations are linked to the favoured concept, the full scope of each listed term, name or phrase is really unlocked (Harpring, 2013).

3.2. Uncontrolled Vocabulary

If controlled vocabularies exist, then there must be many uncontrolled ones. The use of an uncontrolled vocabulary occurs when a given system allows the use of any word or phrase, like hashtags on Twitter and Instagram or tags for YouTube videos. Another excellent example of uncontrolled vocabulary practice is the use of keywords to describe scientific articles (like this paper). Most journals permit any word (or word combination) as a keyword. The problem with this uncontrolled approach is that there are no longer preferred terms, and misspellings happen all the time. Furthermore, uncontrolled vocabularies might include many concepts that are duplicates or near-duplicates. However, even some structure emerges from uncontrolled vocabularies over time; this structure often gets visualised via word clouds (see the editorial introduction of this volume for an example).

At the end of the day, there is no such thing as 100% controlled or uncontrolled vocabularies, because even controlled vocabularies often see concepts being added and dropped. All actual vocabularies thus fluctuate between lesser or greater degrees of control (Pomerantz, 2015). Two final examples can illustrate this: dictionaries and glossaries. A dictionary is typically not considered a pure controlled vocabulary. Despite being a snapshot of a language's vocabulary, that vocabulary changes and dictionaries do not claim to be complete. The same can be said of glossaries: they are traditionally found at the end of a book or article and contain a list of alphabetically ordered terms with a definition. A glossary thus explains specific terms but does not limit the terms one can use; instead, it represents terminology present in the given book or article, not across all works. To call a list of concepts a controlled vocabulary is

thus highly dependent on the goal of that list. The concepts must limit how data can be described, or information can be retrieved in a given system.

3.3. Types of Controlled Vocabulary

There are several types of controlled vocabularies, which all serve different purposes and functions. The following sections describe six types based on Harpring (2013). Each of these types is accompanied by an example from the world of graffiti. Figure 2 shows an Euler diagram of seven controlled vocabulary types, with six described in this paper. The diagram is structured in order of increasing complexity, with 'controlled vocabulary' as the overarching concept and the others as subsets of this concept. For example, a thesaurus is a subset of controlled vocabulary with the additional characteristics of ambiguity control, synonym control, a hierarchical structure, and associative relationships. A thesaurus is always a controlled vocabulary, but not every controlled vocabulary is a thesaurus.

The first type of controlled vocabulary is a 'subject heading list'. These lists consist of fixed terms or phrases which can describe and cluster subjects and are allocated to books, articles, and other written or recorded documents. Subject heading lists are organised alphabetically, and links exist between favoured, non-favoured and other headings (i.e., ambiguity control). So, using a subject heading list, all materials regarding one topic are gathered under one designated term, making it especially applicable in a library environment, as this allows one to look up several synonyms of a word to find all the information on the topic in question. The headings can derive from a combination of strings, e.g. a period, a location and a type like 'Medieval church graffiti' (see Figure 2 top left).

The second controlled vocabulary type is a 'controlled list' (also referred to as a 'flat term list', 'simple term list', or 'pick list'). These are straightforward lists of terms (or phrases) arranged either alphabetically or logically. The terms should be unique, not overlapping in their meaning, all part of the same category and with an identical level of detail. An example would be an alphabetical list of the materials used for producing a 'graffito as object' (e.g., brush, marker, paint, roller, spray can, etc.; see Figure 2 top middle). Controlled
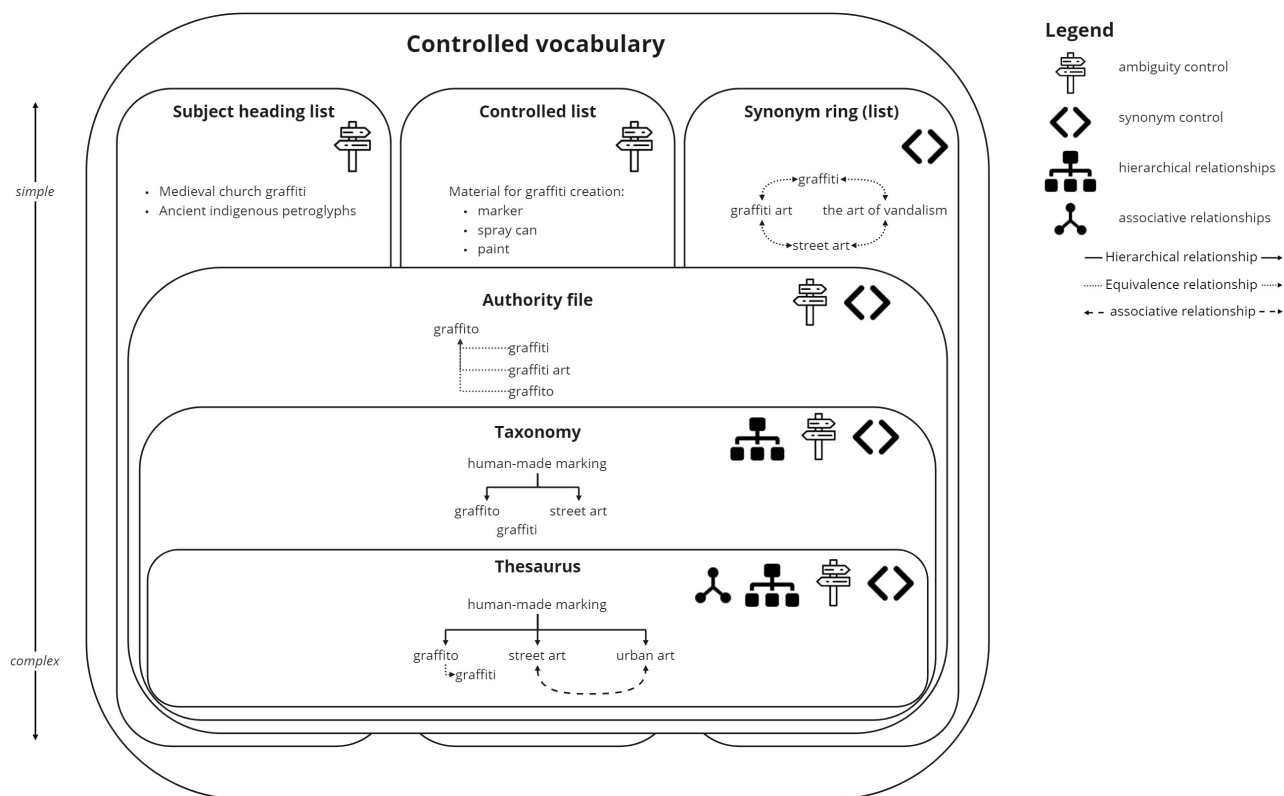
Figure 2. Different types of controlled vocabulary with examples.

lists are best used in a database environment if a short list of synonym-free terms is needed; these terms could be part of a simple drop-down menu in a graphical user interface.

The third type, a 'synonym ring' or 'synonym ring list', refers to the retrieval of information rather than the indexing of terms. Suppose one uses Google.com to search for the term 'graffiti'. In that case, the search results will also include websites, images, documents and other results which are tied to associated keywords like 'graffiti art', 'the art of vandalism', and 'street art' (see Figure 2 top right). Terms (or phrases) in a synonym ring are connected to their synonyms and near-synonyms.

The fourth form of controlled vocabulary is an 'authority file'. This is a valuable tool in a database or search environment as it enables both ambiguity and synonym control. Thereby, the preferred terms (of a concept) are always used in indexing rather than any variations or alternatives. So, if

one were to search the terms 'graffiti', 'graffito', 'graffiti art' on INDIGO's planned online 3D platform, the system would automatically return the term used in that environment, which is 'graffito', after having linked the user's terms to this authorised term.

'Taxonomies' are the fifth type of controlled vocabulary presented here, and they mainly include the preferred terms to be used. These concepts are structured hierarchically, which means that concepts feature a parent-child or broader-narrower relationship (see Figure 3 right—connection from 'graffito' to 'writing'). Overall, a taxonomy follows a simple structure and has only relatively shallow hierarchical relations between concepts. An example is given in Figure 2, which shows the hierarchical connection of 'human-made marking' as the parent term of 'graffito', and the equivalence relationship between 'graffito' and 'graffiti'. A 'thesaurus' is a semantic network of unique concepts, the sixth type of controlled vocabulary. These terms are con-
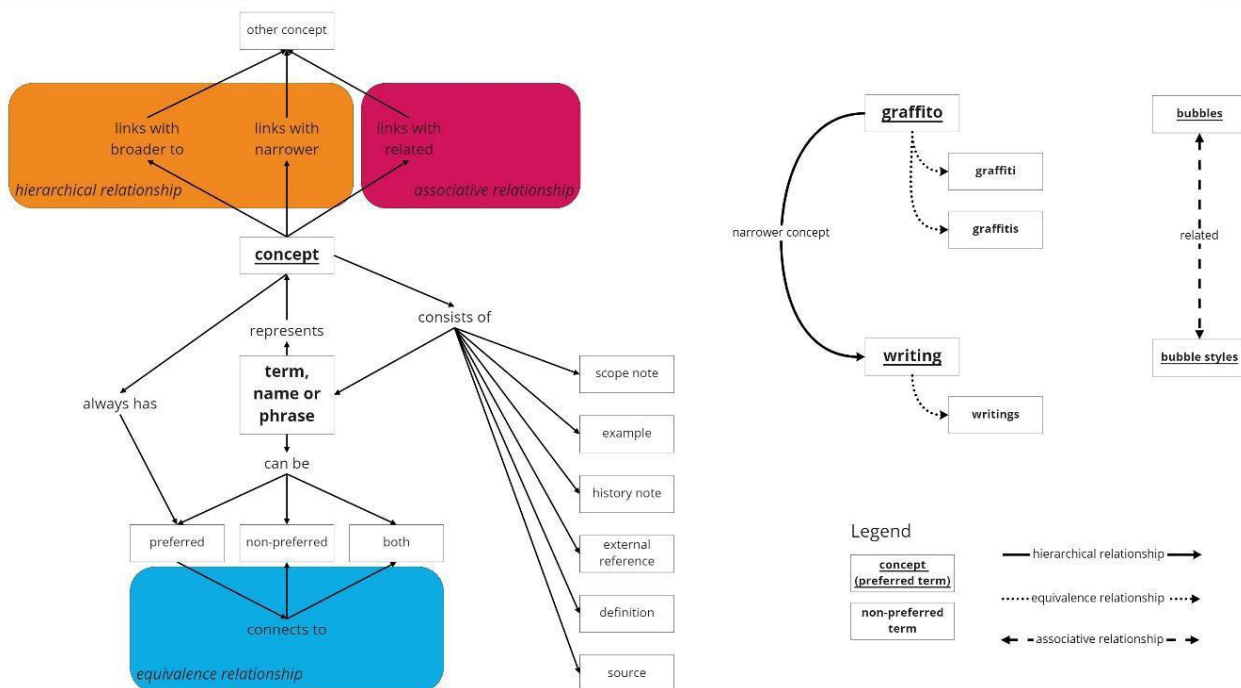
Figure 3. On the left: visualisation of the different elements in a thesaurus, including 'concept' as the centrepiece and the three different types of relationships; on the right: visualisation of the different relationships that are present in a thesaurus.

nected via three different types of relations. The first one is the hierarchical relation (see also the previous paragraph on 'taxonomies'); the second is the equivalence relation (i.e. synonyms and lexical variants); and the third one is the associative relation, which is unique to a thesaurus and links related concepts like 'bubble styles' to 'bubbles' or 'street art' to 'urban art' (on the right in Figure 3).

3.4. Knowledge Organisation
In the existing body of graffiti literature—both popular and scholarly—many attempts have been made to describe or structure graffiti-related terminology. Table 1 presents a small sample of the numerous lists of terms, glossaries or different types of controlled vocabularies inventoried by project INDIGO. However, most of those attempts are deficient in one or more aspects. They often cannot be updated (e.g., when printed in a book), do not include relationships, hierarchies, and synonyms, or lack accessibility (e.g., when included in old magazines or PhD theses of which no (dig-

ital) copies are available). How project INDIGO aims to fill these gaps, is further detailed in section 4.

4. Building the INDIGO Thesaurus on 'Graffiti'
So far, no thesaurus has been developed for the specific domain of graffiti. But the use of controlled vocabularies in a cultural heritage environment such as graffiti, which is intricately connected to human creativity and expression, would not only enable these works to be discovered, studied and compared but also appreciated (Harpring, 2013). To construct and implement a thesaurus properly, it is recommended to start by outlining its structure as it would be displayed in a hierarchical diagram. To do this, one of the more common, "well-established and reliable method[s], underpinned by a rational, scientific theory" (Broughton, 2006, p. 107) is 'facet analysis'.
'Facets' are groupings of terms of the same inherent class or

	Graf, 2018	Gottlieb, 2008	INGRID, 2019	Cooper & Chalfant, 1984	ArtCrimes (graffiti.org, accessed 08/10/2022)	INDIGO
Type of KOS	Simple term list	Simple term list	Simple term list	Glossary	Glossary	Thesaurus
Controlled vocabulary	Yes	Yes	Yes	No	No	Yes
Term definitions	Yes	Yes	Yes, if not self-explanatory	Yes	Yes	Planned
Includes illustrations	No	No	Yes	For some	No	Planned
Umbrella term	Street art and graffiti art	Graffiti art style	Graffiti	Subway graffiti and writing	Graffiti	Graffiti

Table 1. Overview of different types of KOSs published in the domain of graffiti.

category (see ISO 25964-1:2011, section 2.20 Facet; International Organization for Standardization, 2011, p. 4) and can be seen as the most general concepts in a thesaurus. One thesaurus that has been structured using facet analysis and furthermore contains numerous concepts regarding art and architecture is the Getty Research Institute's Art & Architecture Thesaurus (Getty AAT). Its development started in the 1970s, and the thesaurus gets updated regularly. The Getty AAT is concept-focused and takes the form of a hierarchical database with eight facets representing the main subdivisions: Associated Concepts (abstract concepts), Styles and Periods (visual and geographical classification of human-made works), Physical Attributes (appearance, design choices and quality of a human-made object), Agents (role of a single person or group), Activities (actions, endeavours, and tasks), Materials (natural or synthetic materials), Objects (human-made and tangible or visible), and Brand Names.

The scope of the Getty AAT is not only the cataloguing, discovering, and retrieving of information on art and architecture, but also on visual heritage and works (Harpring, 2013). Therefore, terms related to 'graffiti' can also be found among the available concepts (see Table 2). Each of the concepts is assigned an ID that uniquely identifies it, a preferred term (the name most often used for this concept in the scholarly literature), alternative terms (if any; there may be one or more), a scope note, related terms, hierarchical relations, and affiliation to one of the eight facets. The complete list of fields used in a concept record can be found in the Getty AAT Editorial Guidelines (Harpring, 2020, section 2.5). The concepts related to graffiti that are already present in the Getty AAT help us understand that it is possible—and productive—to construct a thesaurus on graffiti using facet analysis and that we can build on the Getty AAT. Unlike the Getty AAT, the INDIGO graffiti thesaurus will be subject-based, meaning all terms and concepts will be focused on graffiti—as activity, object, and style. Therefore, using the Getty AAT structure of hierarchies, facets, and associative relationships is likely too complex for a subject like graffiti, but nevertheless, it will provide a basic structure (see Figure 4). Of course, some adjustments will be necessary: the hierarchy needs to be flattened and filtered to make it usable for a thesaurus of more restricted scope, as the original hierarchy of the Getty AAT is rather deep.

Eventually, INDIGO's thesaurus should provide the terminology to describe graffiti in a structured and consistent way, just as the Getty AAT can be used to describe a work of art.

ID	Preferred term in English	Alternative terms [only selected terms in English]	Facet
300379259	black books (graffiti)	black book (graffiti); blackbooks (graffiti)	Objects Facet
300410273	bombing (graffiti)	bombed (graffiti); bomb (graffiti)	Activities Facet
300410278	burners (graffiti art)	burner (graffiti art)	Objects Facet
300410279	end to ends	end to end; E-E (end to ends); E2E; E-to-E	Objects Facet
300015613	graffiti (casual notations)	graffito (casual notations)	Objects Facet
300410270	graffiti art	art, graffiti; graffiti (graffiti art)	Objects Facet
300312066	graffiti artists	graffiti artist; artists, graffiti	Agents Facet
300428775	paint stencil	-	Objects Facet
300410272	pieces (graffiti art)	piece (graffiti art)	Objects Facet
300379258	placas	placa; placazos; plaques (graffiti)	Objects Facet
300053436	pochoir (technique)	-	Activities Facet
300410281	productions (graffiti art)	production (graffiti art)	Objects Facet
300266416	sgraffito (technique)	decoration, graffito; graffiato; graffito (decoration)	Activities Facet
300028878	stencils (visual works)	stencil (visual work)	Objects Facet
300056477	street art	art, street; street works; works, street	Associated Concepts Facet
300264511	subway graffiti	-	Objects Facet
300410284	tags (documents)	tag (document)	Objects Facet
300410271	throw-ups (graffiti works)	throw-up (graffiti work); throwies; throwie	Objects Facet
300400516	urban art	urban arts; art, urban	Associated Concepts Facet
300410274	whole cars	whole car	Objects Facet
300410277	Wildstyle	wild style; Wild style	Styles and Periods Facet
300410377	yarn bombing (graffiti art)	yarn storming (graffiti art); graffiti knitting (graffiti art); bombing, yarn (graffiti art)	Objects Facet

Table 2. Some of the concepts incorporated in the Getty AAT that are related to graffiti.

The construction of the graffiti thesaurus is currently going through a series of discussions and restructuring phases. Initially, the first step was to collect books, papers, blog posts, websites, and YouTube videos, focusing on any part of the domain of graffiti. Helpful information was recorded in a spreadsheet, where each new row was considered a new term and references to literature were added in new columns. The result was an alphabetical list of over 700 preferred terms. The number of bibliographical references added to a term made it possible to find out which terms are most often used and, thus, probably the most important and most widespread in the graffiti community.

In a next step, the terms will be filtered according to their relevance to project INDIGO and their importance and usage throughout the literature. This will result in a list of concepts focusing on the most common terms in the modern graffiti community. Train-related community terms like 'end to ends' and 'whole cars' will initially not be included, as project INDIGO currently only covers immovable surfaces. Afterwards, these concepts and terms will be structured visually using a mind map tool (like Miro—https://miro.com) and considering the three different relationships that make up a thesaurus (equivalence, hierarchy and association). Furthermore, these selected concepts will be assigned to the facets of the Getty AAT.

However, there are further aspects that must be considered in the development of the graffiti thesaurus: the grammatical number of the preferred term, the overall language of the thesaurus (which also impacts its accessibility), and the properties through which each concept will be described.
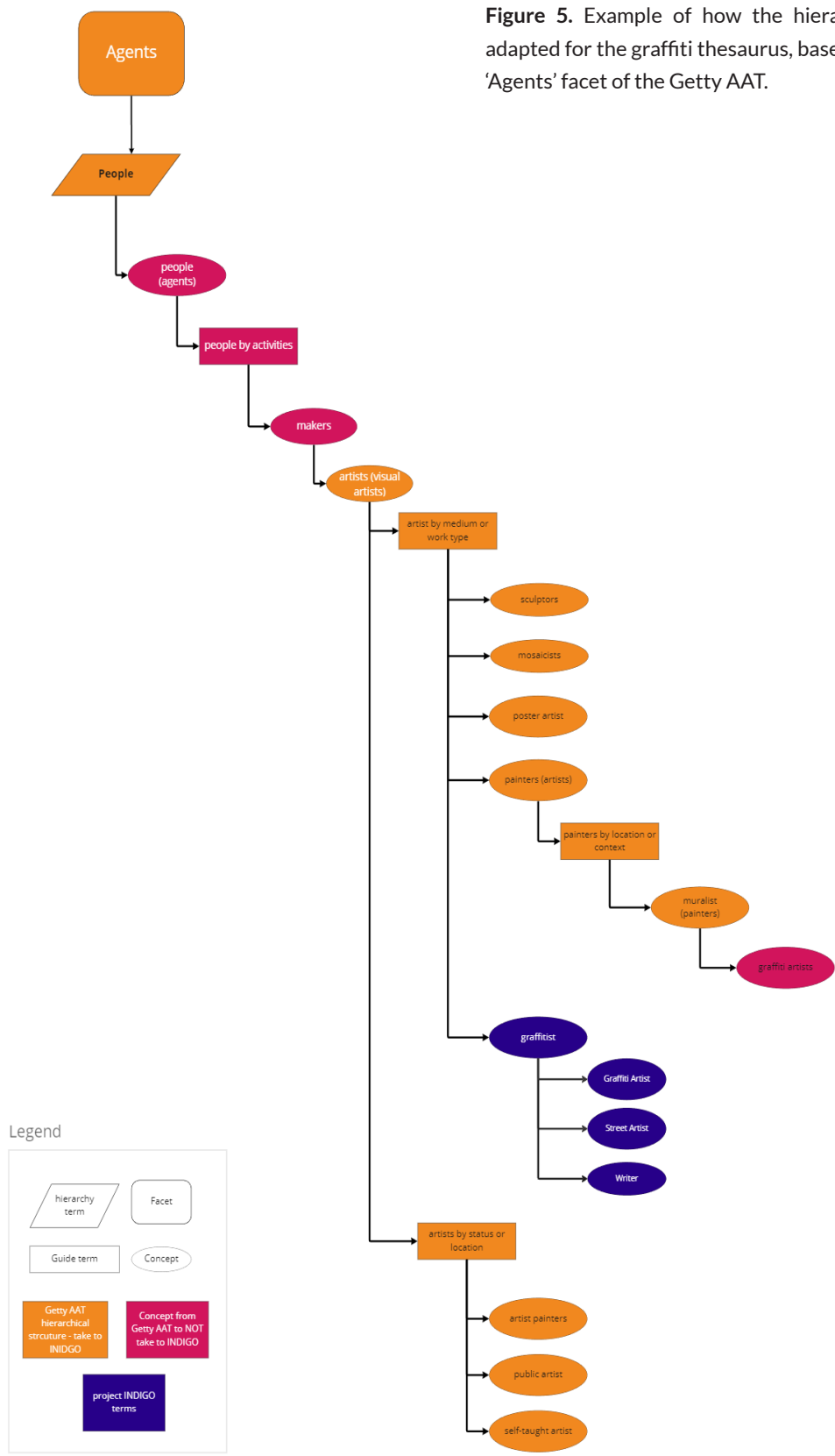
Figure 5. Example of how the hierarchical structure is adapted for the graffiti thesaurus, based on a section of the 'Agents' facet of the Getty AAT.

In the Getty AAT, preferred terms are presented in the plural form of the word; the singular form is usually recorded among the alternative terms. Furthermore, the terms are generally written in lower case, unless it is a proper noun like 'Wildstyle'. The same grammatical and stylistic conventions will also be adopted for the graffiti thesaurus.

Hierarchical Position:
- Objects Facet
- .... Visual and Verbal Communication (hierarchy name) (G)
- .... Information Forms (hierarchy name) (G)
- .... information forms (objects) (G)
- .... document genres (G)
- .... <documents by form> (G)
- .... inscriptions (G)
- .... graffiti (casual notations) (G)

Figure 4. The hierarchical structure of the concept 'graffiti (casual notations)' in the Getty AAT.

The modern graffiti community mainly relies on English for its terminology; therefore, it is common practice that an English term is not translated but used in other languages to describe the same element. This also stems from the fact that the graffiti scene became globalised through films like *Wild Style* (Ahearn, 1983) and *Style Wars* (Silver, 1983), as described at the beginning of this paper. Therefore, English seems the most logical choice as primary language for a graffiti thesaurus. However, there are many regionally developed graffiti styles and types, such as 'pochoir' (French) or 'placas' (Brazilian), for which there is no equivalent English term. In these cases, the original terms are also used in English to refer to these styles and types. Terms like these will also be adopted in the graffiti thesaurus as preferred terms for the related concepts.

To describe a concept, we will rely on the concept scheme provided by the Simple Knowledge Organisation System (SKOS), which can be used to publish different types of controlled vocabulary on the web. SKOS is based on the Resource Description Framework (RDF), the data model to which, ideally, all linked open data should adhere. This means that we will have concepts linked together by semantic relationships and that all information represented by INDIGO's thesaurus will be machine-readable and interoperable in a wide variety of contexts. SKOS was established by the W3C Semantic Web Best Practices and Deployment Working Group (Miles et al., 2005) and became a W3C recommendation in 2009 (a practical guide to SKOS can be found in Semantic Web Deployment Working Group, 2009).

A further step will be to make the INDIGO thesaurus publicly available. For this purpose, we will use the Vocabs service (https://vocabs.acdh.oeaw.ac.at) provided by the Austrian Centre for Digital Humanities and Cultural Heritage (ACDH-CH). Vocabs is based on Skosmos (https://skosmos.org), an open-source, web-based SKOS browser and publishing tool for controlled vocabularies. Skosmos also supports multilinguality for browsing and searching and allows for the publication of different types of vocabulary (Suominen et al., 2015). The publication on Vocabs will offer the possibility of updating and expanding the thesaurus iteratively.

5. Conclusions

'Graffiti' cannot be viewed from one single angle. It is a complex term that can refer to different concepts, which is why we are using a threefold approach—'graffiti as activity', 'graffiti as objects' and 'graffiti as style'. To capture the complexity of this term and related terminology, one needs not only a detailed exploration of the domain but also an effective way of representing this knowledge. In different projects and publications, various KOSs have been applied to the domain of graffiti, but nevertheless, the best-suited type of controlled vocabulary for cataloguing, archiving, and retrieving graffiti information is a thesaurus. Furthermore, the specific method of facet analysis and the choice of the Getty AAT as basis for INDIGO's thesaurus showed several advantages, including the possibility of capturing and representing the many-sided nature of the concept of graffiti.

The INDIGO thesaurus is not intended as a tool in the hands of a few. Ideally, it might become a standard instrument for anybody in graffiti research willing to increase systematisation and improve interoperability. Moreover, the workflow and the decisions made during the construction process could serve as an example for similar initiatives in other sectors.

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