

Texts, Compositions, and Works: A Socio-Cultural Perspective on Information Entities

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Abstract

The increasing adoption of computer technologies in the human sciences brought out the need for the ontological modeling of literary works (simply works). Despite the debate, the nature of works remains challenging. Applied ontologists, especially when dealing with foundational topics, have been using the notion of information artifact for capturing multiple dimensions of linguistic expressions, among other things. Surprisingly, the communities analyzing works and information artifacts have only marginally interacted. By assuming an interdisciplinary stance, we look at works by relying on theories coming from philology, philosophy, and artificial intelligence. The core idea is to consider works as socio-cultural entities emerging from social processes of meaning negotiation. This brings us to discuss the notions of text and composition, as well as to look at interpretation and collective agreement processes. By the end of the paper, we will see how our results can shed some light on information artifacts, too.

Keywords

literary work, information artifact, meaning negotiation, interpretation

1. Introduction

The modeling of experts' knowledge and data related to *literary works*¹ plays a relevant role in research at the intersection between computer science and human sciences considering the increasing adoption of computer technologies in the latter fields [1, 2]. Despite this, the characterization of what a literary work is, the relation(s) it entertains with texts, languages, authors, readers' interpretations, just to mention some research topics, remain challenging. Not to mention that, although literary works are studied by different disciplines and from different perspectives (see, e.g., Davies and Matheson [3] in philosophy, Pierazzo [4] in scholarly editing, and Asher and Lascarides [5] in linguistics), there is only little multi-disciplinary interaction (see [6, 7] for similar considerations). Among the various proposals, applied ontologists – especially when working with foundational ontologies – have been using the notion of *information*

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¹We will consider novels as typical examples of literary works since these are the entities mostly discussed in the ontological debate. We do not however focus on the specific features that they must bear to qualify as *novels* or *literary* entities. Hence, our considerations hopefully apply to verbal documents in general.

artifact to represent literary but also musical works, design models, software, images, etc. [8, 9]. However, different ontologies use different terminologies and, as a matter of fact, the notion of information artifact remains only vaguely characterized (see [10] for a state of the art analysis).

Given this situation, we believe that the cross-fertilization of different research efforts can be of great benefit to reach broader and at the same time deeper insights on research open issues. It is therefore with an interdisciplinary attitude that we tackle some ontological challenges relative to the modeling of literary works (we will simply say ‘work’ from now on when the context is clear). Hopefully, a thorough analysis of works will also contribute to shed some light on the more general notion of information artifact, limiting – for the sake of this research – to those addressing the representation of linguistic expressions. Our present purpose is the individuation of the main notions necessary to capture a socio-cultural perspective on works (and information artifacts). Admittedly, this is only a first step towards a formal theory which could play an important role in both theoretical and application scenarios.

The remaining of the paper is structured as follows. Sect. 2 provides an overview of the debate about works and information artifacts in order to contextualize our effort in an interdisciplinary perspective. Sect. 3 presents a preliminary modeling framework focused on the notions of *text*, *composition*, and *agreement*, which are all useful to tackle some philological modeling challenges. The framework is extended in Sect. 4 to the notion of *literary work*. Sect. 5 concludes the paper and discusses how the proposed approach contributes to the analysis of information artifacts.

2. Literary Works and Information Artifacts

The notion of literary work has been used and studied under different perspectives, ranging from philosophy of art, which raises, e.g., metaphysical questions on the nature of works, to philology, librarianship and literary studies, where the term ‘work’ is often used to group similar documents or texts, possibly derived one from the other (see below for references). In this section, we will examine some of the main issues discussed in research and compare the debates with those taking place in applied ontology around the notion of information artifact. The purpose is to understand what the common grounds of the analyses are and what insights can be transferred from one domain to the other.

First, it is commonly assumed that the same work can be expressed by multiple texts, possibly even written in different natural languages. An example by Wilshire [11] is that of Virginia Woolf’s novel *To the Lighthouse*, which was published in England and America with slight differences in the texts. Wilshire claims that people assume to have read the same novel when they have actually read it in either one or the other variant. A similar consideration applies to translations, since people claim to have read the same novel even if they read the translation of the original text. Apparently, therefore, works’ identity is not bound to the original texts, or even to the languages in which their texts are written.

A second remark is that literary works may exhibit – what we could call – a stratification of contents. Consider, e.g., George Orwell’s *Animal Farm*, which can be read either as a novel where animals act and behave as humans or as an allegoric criticism against certain forms of power. It is likely the case that only readers informed about Orwell’s narrative and the social context of its production can grasp the second reading. This example tells us at least two things.

The first one is that literary works are the subjects of *interpretation acts* depending on readers' linguistic competences, background knowledge, and interpretative approach, among others. For instance, an interpretation based on a psychoanalytic approach might differ with respect to a gender-driven or post-colonial one. Interestingly, some interpretations can acquire a recognized social status and can even become reference interpretations for others, e.g., when they are expressed by authoritative bodies (either single scholars or communities of scholars).

The second one is that literary works are the intentional product of their authors, therefore they somehow embed their intentionality, i.e., what the author wishes to say [12]. From a philological perspective, however, it is challenging to understand how much in a text is the product of its author and how much depends on the editorial processes that have brought the texts in our hands [4].

These considerations bring us straightforwardly into the fundamental question of what a literary work is. There has been a plethora of words spent on this topic (for some overviews, see [13, 14, 15, 16]). Some claim that a literary work is a *text type*, i.e., a sequence of characters in a language consisting of spaces, letters, and possibly punctuation marks. This position, sometimes called *textualism* [3], runs against some of the considerations above; e.g., one cannot claim that two persons read the same novel if they have read it in French and Italian, respectively. At the opposite side, others argue that works identify with their *contents*, i.e., what the text of a work says. Proponents of this view generally agree in understanding a text's content as the text's meaning but disagree about how to conceive meanings. It is in fact a matter of hot debate [17] whether (i) meanings depend on the interpretation acts of single agents and reduce to agents' mental entities, or they are sort of extra-linguistic and agent-independent entities which multiple agents can capture through language; (ii) meanings bear a social nature, e.g., when agents agree on a common interpretation; (iii) a text has a unique (and possibly stratified) meaning corresponding to, e.g., what its author meant.

In this highly variegated landscape, in philological contexts, Shillingsburg [14] claims that “[w]e should be suspicious of locutions like ‘the work itself’, for the work exists only in our construct of it. While the text and the document [i.e., the text's physical support] are clearly material, *the work is a mental construct*” [14, p.180] (emphasis is ours). More emphatically, “[t]exts do not mean things; people mean things by text” [14, p.178]. Along these lines, in analytic philosophy, Thomasson [18] distinguishes between *text*, *composition*, and *literary work*. The first is “a sequence of symbols in a language (or languages)” [18, p.64]; the second is “the text as created by a certain author in certain historical circumstances” (ibid.); the third is “the novel, poem, short story, or so forth having certain aesthetic and artistic qualities and ordinarily telling a tale [...]” (ibid.). More specifically, “[a] literary work [...] can exist only as long as there are some individuals who have the language capacities and background assumptions they need to read and understand it” [18, p.11]. Also, “[o]ne and the same composition can serve as the foundation for two different literary works in the context of different readerships” [18, p.65]. In Thomasson's view, therefore, a literary work is a composition as interpreted by some agents who share similar competences and assumptions. For a single composition, there can be therefore as many different works as there are corresponding interpretations.

Surprisingly enough, similar positions are found in the characterization of information artifacts in applied ontology but without explicit comparisons.

In this context, a position close to textualism has been proposed on the basis of the Basic Formal Ontology [19] (BFO) by the so-called Information Artifact Ontology (IAO).² This latter has the notion of *information content entity* at its core [20]. Quoting from Arp et al. [19], “[t]he novel *Robinson Crusoe* [i.e., an information content entity] [is] a generically dependent continuant instance, an *abstract pattern*, made concrete through the acts involved in printing successive copies” [19, p.106]. Information content entities are therefore abstract patterns of characters, i.e., expression *types* one may say, rather than contents/meanings. It is not by chance that the IAO subsumes the class *Text* directly under *Information Content Entity*.

A different stance is taken in the research work of Mizoguchi [9] and Gangemi and Peroni [8], where information artifacts are understood as expressions’ contents, and the notions of content and meaning are interchangeably used. According to Mizoguchi [9], a (well-formed) expression in a language encodes a meaning, which does not however depend on interpretation acts. In this sense, meanings are extra-linguistic entities to be grasped through language. Gangemi and Peroni [8] adopt a semiotic approach according to which it is an agent’s choice to attach a meaning to their expressions. The authors do not take a specific position on the nature of meanings in order to make their approach suitable for different perspectives; e.g., meanings could either exist in the minds of single agents or could be conceived – *à la* Mizoguchi – as some sorts of *abstracta* encoded in expressions. Bateman [6] adopts a similar perspective, but he is also explicitly committed towards the understanding of expressions’ meanings as agents’ mental entities. In this view, the meanings constructed by the members of a linguistic community are necessarily different but they share some *structural similarities* in virtue of which communication can take place. Bateman’s perspective is grounded on socio-semiotics, namely, quoting Halliday [21], on the “recognition of the fact that language and society [...] is a unified conception, and needs to be understood and investigated as a whole. Neither of these exists without the other [...]” [21, p.12].

Finally, Arrighi and Ferrario [22], though not directly addressing the characterization of information artifacts, make a proposal on how to conceive meanings which is relevant for our purposes. In particular, building on philosophy, cognitive sciences, and artificial intelligence, Arrighi and Ferrario distinguish between what they call *private* or *speaker’s* meaning, and *literal* or *public* meaning. The *private meaning* of an expression is a mental representation of an individual evolving through time and interaction with the aim of reaching an agreement with other individuals and to be more successful in future interactions. The authors suggest to use semantic networks [23] as a means to represent meanings; these are graphs whose nodes represent concepts and whose edges stand for the relations (of similarity, inclusion, etc.) between concepts. The individual’s experience and their interaction with other individuals continually reshapes such semantic networks and thus the private meaning they attribute to a linguistic expression. Turning to *public meaning*, this is an abstraction, a generalization, a (weighted) “mean value” of the private meanings attributed by the members of a community; it also changes (even if slower) after each successful interaction, being the result of a mean between varying values (the private meanings).

We believe that Bateman’s [6] and Arrighi and Ferrario’s [22] proposals can be useful to

²The OWL version of the IAO is available at: <https://github.com/information-artifact-ontology/IAO>, last accessed in June 2021.

characterize works and information artifacts, as well as (some of) the challenges mentioned above. By stressing indeed the social dimension of linguistic phenomena, these perspectives allow works and information artifacts to be considered at both the individual and social scale and as the product of dynamic processes of semantic negotiations. We will see in the next section how this idea can be transposed in ontological terms.

3. Texts, Compositions, and Agreements

We sketch in this section our proposal to represent the main concepts introduced in the previous sections, like text, composition, interpretation, agreement (between different interpretations), and derivation (of one composition from another).

Texts and compositions. A *text* is here intended as a structured and abstract sequence of characters that is (socially) recognized as belonging to one or several languages (in the case of multilingual texts). We mainly focus on texts written in natural languages, but our proposal applies to oral expressions and other kinds of information artifacts (e.g., related to music), too. In this perspective, texts differing even for a single character are not identical. We also abstract from typographic features like characters' font or their spatial arrangement in printing layouts; these features play a relevant role in some research studies (see, e.g., [1, 24]) but are less relevant for our present purposes. Finally, because of their abstract nature, texts can have multiple realizations [1, 10], e.g., the various physical copies of, say, *Animal farm* found in libraries and bookshops. We do not explicitly consider realizations here.

Without entering into the debate on the nature of language, the way a text is parsed (e.g., whether morphological and/or grammatical characteristics are considered), and the background knowledge that agents must have to be competent with respect to a language, we consider three general primitives that are compatible with different views on these aspects, namely:

- $\text{LNG}(l, x)$, read as 'l is the language of at least a part of the text x';
- $\text{CMP}(a, l, t)$, read as 'at time t, the agent a is a competent user of language l';
- $\text{PRD}(a, x, t)$, read as 'at time t, the agent a finishes producing (a realization of) text x'.³

Even though realizations are not in the domain of quantification, the production of a text is intended as the production of a material entity realizing the text. Hence, two authors may produce the same text if they produce different realizations for the same text. Axiom (a1) guarantees that the agent who produces a text is linguistically competent.

$$\mathbf{a1} \quad \text{PRD}(a, x, t) \wedge \text{LNG}(l, x) \rightarrow \text{CMP}(a, l, t)$$

Following Thomasson [18], we distinguish between *texts* and *compositions*; as said in the previous section, the latter are more than (abstract) sequences of characters, because their identity is bound to both their authors and production time. The same text but not the same composition can be indeed produced by different authors in different periods, i.e., compositions

³To simplify, we assume that a text (and, as we will see, a composition) is produced by a single agent in the role of author. The framework could be adjusted to cover collective authors.

are *texts qua produced* by given authors at given times. Thomasson remains generic on the nature of compositions and their relation to texts. On our side, we model compositions as *qua-entities* following the approach in [25]: a composition *inheres* (a form of existential dependence) in a single text, *specifically historically depends* on a single author, and *starts to exist* only when the text it inheres in is produced. We consider the following primitive relations to formally characterize these aspects: (i) $IN(u, v)$ stands for ‘the entity u inheres in the entity v ’; (ii) $HD(u, v)$ stands for ‘the entity u is specifically historically dependent on the entity v ’; (iii) $EX(u, t)$ stands for ‘the entity u exists (is present) at time t ’; finally, (iv) $<$ is the standard relation of (strict) temporal precedence.⁴ Axioms (a2) and (a3), where $c(x)$ stands for ‘ x is a composition’, establish a one-to-one correspondence between the compositions and the productions of the texts they inhere in. Furthermore, (a2) guarantees that compositions can exist only starting from their production. As a boundary case, if an agent produces the same text several times, one would have various compositions differing only because of their temporal extension. We do not commit to the way in which the persistence through time of compositions is linked to the existence of the originally produced realization, or to copies of such realization.

$$\mathbf{a2} \quad \text{PRD}(a, x, t) \rightarrow \exists!c(c(c) \wedge IN(c, x) \wedge HD(c, a) \wedge EX(c, t) \wedge \forall t'(t' < t \rightarrow \neg EX(c, t')))$$

$$\mathbf{a3} \quad c(c) \rightarrow \exists!xat(IN(c, x) \wedge HD(c, a) \wedge \text{PRD}(a, x, t))$$

Interpretations and agreements. Moving now to interpretations and considering the distinction between texts and compositions, it seems legitimate to wonder whether there is any distinction between interpreting texts and interpreting compositions. For instance, assume that a contemporary author produces a composition c whose text is (unintentionally) word-by-word identical to the text of composition c' written in the XIV century. A reader may differently interpret c and c' ; e.g., both the topic and linguistic expressions of c – but not those of c' – may appear old-fashioned with respect to contemporary literary practice and readers’ habits.⁵ On the other hand, interpreting the texts only, one might attribute to them the same meaning without further reference to contextual information about their production. In the following, we shall primarily focus on the interpretation of compositions,⁶ which seems to play a more relevant role in literary practices.⁷

Once the subject of interpretations is clarified, we can state some general principles. First an interpreting agent (*interpretant* for shortness) must be a competent user of all the languages of the composition. Second, the associations of meanings to compositions are agent-dependent, i.e., interpretations have an intrinsic subjective dimension. A *mentalist* stance on meanings would conceive meanings as mental entities. However, a precise commitment to the nature of meanings

⁴For limits of space, we do not enter into the axiomatization of these primitives. The reader can refer to [26, 27] for discussions about dependence relations.

⁵For a discussion along these lines, the reader can refer to the philosophical debate on the thought experiment based on Borges’ tale *Pierre Menard, Author of the Quixote* which our example takes inspiration from [3].

⁶We assume that interpretations are always about a whole composition. To account for the dynamic interpretative process behind the reading of a composition – for instance for the fact that the interpretation of a character changes while reading – one could consider the interpretations of parts of the whole composition.

⁷The interpretation of texts can be seen as a generalization of the interpretation of compositions: when an agent limits their interpretation to compositions’ texts, if the texts are the same, then the agent attributes the same meaning to them independently from the compositions that inhere in them.

is not necessary for our aims. One could indeed embrace a *non-mentalist* view where meanings are abstract ideas or concrete individuals existing independently of interpretants but still consider the association of meanings to compositions as subjective.⁸ Third, an agent can ground their interpretation on various information, e.g., scholarly essays. Such information plays a central role for associating a precise meaning to the composition at stake. As a consequence, agents may have different interpretations (grounded on different information) of the same composition. This is relevant in both diachronic and synchronic scenarios where the information available to the agents evolves through time or where the agents select specific interpreting perspectives.

In order to grasp the (dis-)similarities between interpretations and to possibly “generate” socially shared interpretations, we need a way to compare subjective interpretations of single agents. For instance, one may say that there is a (perfect) *agreement* on composition c when the meanings associated to c by different agents are *structurally* indistinguishable (or perhaps even identical in a non-mentalist perspective). One may also accept interpretative differences between agents, i.e., (partial) agreement does not presuppose a full structural match but it can be based on weaker relations between the meanings’ structures. These approaches presuppose to have complete access to meanings (e.g., to their structures), which remains challenging considering their vague, “black box” nature.⁹

We shall follow here a different approach. Rather than referring to meanings in the first place and establishing their similarity, the idea is to rely on socially shared public agreements about compositions as sorts of empirical evidences for meanings’ similarity. Hence, instead of saying that two (or more) agents agree about the meaning of composition c because of the similarity in the individual meanings that each attributes to c , we simply take their agreement as evidence for the similarity of the meanings they ascribe. In this manner, meanings are not in the domain of quantification and then we do not need to characterize them.

To make sense of these considerations, we assume that an agent has access to *their own* interpretations and is able to internally evaluate their similarity. The assumption is that the interpretant *introspectively* knows the similarity between the meanings that they associate to two compositions. Hence, rather than committing to similarity between meanings, we introduce the primitive predicate *iAG* for *introspective agreement*:

- $iAG(a, c_1, c'_1, c_2, c'_2)$ reads as ‘for the agent a , their interpretation of c_1 based on c'_1 is similar to their interpretation of c_2 based on c'_2 ’.

To improve readability, we write $iAG(a, c_1/c'_1, c_2/c'_2)$ instead of $iAG(a, c_1, c'_1, c_2, c'_2)$. With respect to what was said above, the additional information used by the agent is made explicit by the additional compositions c'_1 and c'_2 standing for the materials used by a to interpret c_1 and c_2 , respectively. For instance, a interprets the English and Italian translations of *Animal Farm*, represented by c_1 and c_2 , respectively, in the light of essays about Orwell, i.e., c'_1 and c'_2 (it could be the case that $c'_1 = c'_2$). Introspective agreement is symmetric and transitive (and then reflexive) in the sense made explicit by (a4) and (a5).

$$\mathbf{a4} \quad iAG(a, c_1/c'_1, c_2/c'_2) \rightarrow iAG(a, c_2/c'_2, c_1/c'_1)$$

⁸The distinction between mentalist and non-mentalist approaches on meanings is due to [17].

⁹A possible way to compare meanings on the basis of their structures could be done in terms of semantic networks, see [22]. This possibility requires further research.

$$\mathbf{a5} \quad \text{iAG}(a, c_1/c'_1, c_2/c'_2) \wedge \text{iAG}(a, c_2/c'_2, c_3/c'_3) \rightarrow \text{iAG}(a, c_1/c'_1, c_3/c'_3)$$

The predicate iAG does not have a temporal argument. The underlying idea is that a change in the interpretation of a composition must be explicitly justified by a change in the used information; e.g., $\neg \text{iAG}(a, c_1/c'_1, c_1/c''_1)$ states that, according to a , by shifting from the information c'_1 to c''_1 , the interpretation of c_1 changes. In this manner, we avoid situations that are expressible by means of a temporally qualified version of iAG like $\text{iAG}(a, c_1/c'_1, c_1/c''_1, t) \wedge \neg \text{iAG}(a, c_1/c'_1, c_1/c''_1, t')$ where the reason for the shift in the interpretation would not be explicit.

We now introduce *mutual (public) agreements*. The idea is that agents *make public* their interpretation(s) of a composition c by exhibiting additional compositions which are intended to make more explicit and clarify the meanings attributed to c . For that we consider the primitive $\text{EXP}(a, c', c, t)$ telling that the agent a publicly exhibits the composition c' to (possibly partially) *explain* the way in which they interpret c , e.g., c' can contain additional information used by a to interpret c . The mutual agreement (mAG) of agents a_1 and a_2 on the interpretation of the composition c (at time t) can be defined as in (d1). This formula tells that both agents a_1 and a_2 exhibit an explanation for c , i.e., c_1 and c_2 , respectively and, for each agent, the interpretations complemented by the two explanations are similar. From a different perspective, mutual agreement means that the provided explanations do not show any reason for *disagreement*. The mutual agreement might be however “false”, e.g., because the explanations are only partial and no incompatibilities emerged from them. (Public) disagreement is defined in (d2). In this case, the explanations are enough to recognize an incompatibility.¹⁰

$$\mathbf{d1} \quad \text{mAG}(a_1, a_2, c, t) \triangleq \exists c_1 c_2 (\text{EXP}(a_1, c_1, c, t) \wedge \text{EXP}(a_2, c_2, c, t) \wedge \text{iAG}(a_1, c/c_1, c/c_2) \wedge \text{iAG}(a_2, c/c_1, c/c_2))$$

$$\mathbf{d2} \quad \text{DISAG}(a_1, a_2, c, t) \triangleq \exists c_1 c_2 (\text{EXP}(a_1, c_1, c, t) \wedge \text{EXP}(a_2, c_2, c, t) \wedge (\neg \text{iAG}(a_1, c/c_1, c/c_2) \vee \neg \text{iAG}(a_2, c/c_1, c/c_2)))$$

Note that if, at a time t , agents can provide several explanations for the composition c , it is possible to have $\text{mAG}(a_1, a_2, c, t)$ and $\text{DISAG}(a_1, a_2, c, t)$ because of the different explanations taken into consideration. This accounts for different perspectives on the same composition, e.g., a_1 and a_2 may agree on the literal interpretation of *Animal Farm* while attributing it incompatible metaphorical readings. Even when the explanation at a given time is unique, it is still possible to have $\text{mAG}(a_1, a_2, c, t)$ and $\text{DISAG}(a_1, a_2, c, t')$ (with $t \neq t'$), i.e., the framework allows representing and tracing the *dynamic* aspects of interpretation and agreement processes. The transition from the agreement to the disagreement (on c) between a_1 and a_2 can be motivated by a change in the explanations exhibited by the agents. For instance, at t' , the agent a_1 could acquire new information motivating a_1 to exhibit a new explanation of c on which a_2 does not agree anymore. This dynamic aspect relative to mutual agreements could be interesting to characterize some aspects of the *history of interpretations*, in particular, to represent how interpretations have interacted, contaminated, and evolved up to the present day. Furthermore, $\text{mAG}(a_1, a_2, c, t)$ does not imply a link between a_1, a_2 , and the author of c ; in a temporal perspective, it only requires t to be after the production time of c . In this sense, mAG allows representing both a sort of “internal

¹⁰Looking at (d2), it is sufficient that only one agent does not introspectively recognize the similarity between the two interpretations to generate a disagreement. In this view, therefore, a disagreement is not necessarily *mutual* (and this is why the formula is represented in disjunctive terms).

agreement” – when a_1 or a_2 is the author of c – or an “external judgment” on c , when neither a_1 nor a_2 are the authors of c . The framework can be extended to take into account a third agent a_3 judging the agreement of a_1 and a_2 on the basis of the explanations they provided, see (d3). This is common in, e.g., the history of literature (philosophy, etc.), where scholars judge *a posteriori* how close the interpretations provided by different authors on certain compositions are.

$$\mathbf{d3} \quad eAG(a, a_1, a_2, c, t) \triangleq \exists c_1 c_2 (\text{EXP}(a_1, c_1, c, t) \wedge \text{EXP}(a_2, c_2, c, t) \wedge iAG(a, c/c_1, c/c_2))$$

The predicates for agreement and disagreement just introduced refer to the interpretations of *single* compositions. We will now deal with the case where agents agree on the attribution of a common interpretation to *multiple* compositions. This is provided by definition (d4) telling that agents a_1 and a_2 are in mutual agreement about the interpretation of c and c' . For instance, two agents both reading the English and Italian versions of *Animal Farm* agree on the attribution of a common interpretation to both compositions.

$$\mathbf{d4} \quad mAG(a_1, a_2, c, c', t) \triangleq \exists c_1 c_2 c'_1 c'_2 (\text{EXP}(a_1, c_1, c, t) \wedge \text{EXP}(a_2, c_2, c, t) \wedge \\ \text{EXP}(a_1, c'_1, c', t) \wedge \text{EXP}(a_2, c'_2, c', t) \wedge \\ iAG(a_1, c/c_1, c'/c'_1) \wedge iAG(a_2, c/c_2, c'/c'_2) \wedge \\ iAG(a_1, c/c_1, c/c_2) \wedge iAG(a_2, c/c_1, c/c_2) \wedge \\ iAG(a_1, c'/c'_1, c'/c'_2) \wedge iAG(a_2, c'/c'_1, c'/c'_2))$$

Finally, (d5) and (d6) extend the notion of mutual agreement introduced in (d1) and (d4) to *groups* of agents, i.e., at t , all the members of the group g mutually agree on the interpretation of c or on the interpretations of c and c' (the predicate MEMB represents the relation of temporary membership between an agent and a group)¹¹. Definition (d7) captures a weak notion of disagreement according to which a group is in disagreement when at least two members disagree. As for mutual agreement, it is possible to have $AGR(g, c, t)$ and $DISAG(g, c, t)$.

$$\mathbf{d5} \quad AGR(g, c, t) \triangleq \forall a_1 a_2 (\text{MEMB}(a_1, g, t) \wedge \text{MEMB}(a_2, g, t) \rightarrow mAG(a_1, a_2, c, t))$$

$$\mathbf{d6} \quad AGR(g, c, c', t) \triangleq \forall a_1 a_2 (\text{MEMB}(a_1, g, t) \wedge \text{MEMB}(a_2, g, t) \rightarrow mAG(a_1, a_2, c, c', t))$$

$$\mathbf{d7} \quad DISAG(g, c, t) \triangleq \exists a_1 a_2 (\text{MEMB}(a_1, g, t) \wedge \text{MEMB}(a_2, g, t) \wedge DISAG(a_1, a_2, c, t))$$

As we will see in the next section, these latter notions play a relevant role to characterize works. Before that, however, let us comment on some aspects for the modeling of compositions.

Compositions and derivations. Borrowing the notion of composition from Thomasson [18], we have assumed a direct link between a composition and its author. However, in scenarios relative to philology or book production, this can be much more complex. In fact, the books that we find in bookshops are the result of *editorial processes* which commonly re-work authors’ compositions – in agreement with authors whenever possible – to suit changed linguistic or editorial norms (e.g., the normalization of punctuation, etc.), readers’ habits, publishing policies,

¹¹Though with these definitions we assume that, to have group agreement, all members of a group agree on the judgment of the interpretations, this is a simplification, as not all groups use unanimity to take decisions. As the literature on judgment aggregation shows [28], many options are available, like majority voting, tyranny (one individual decides for the group), or mixed forms of “weighted majority”. The latter option, for instance, could capture cases in which the interpretations provided by scholars who have a referential status within a (e.g., academic) community might have a higher value in comparison to those provided by laypersons.

or indeed to reconstruct lost originals correcting transmission and scribal errors, etc. From another perspective, one can take the case of translations, in which sometimes some parts of the original composition can even be eliminated (see Eco [29, ch.5]). In the case of editing practices leading to *critical editions* [4], it is common that an editor decides to produce a new edition when they observe relevant asymmetries between alternative compositions for the same work; in general, the purpose is to compile a new composition that is closer, in the editor's view, to the one intended by the original author (although this is controversial) [14].

In all these cases, we are exposed to – what one may call – *derived* compositions, namely, compositions produced by given authors (e.g., editors, translators, etc.) that however originate from, or make explicit reference to, pre-existing compositions that may be produced by different authors. In few cases, the original and the derived compositions are produced by the same author. Let us call these *authorial* derivative compositions (or *authorial editions*). An example from the Italian history of literature is that of Alessandro Manzoni's *Promessi Sposi* which was published in 1827 and then revised by Manzoni in 1842 with respect to the stylistic features of the text. It is commonly agreed that Manzoni intended the '42 edition to improve the one produced in the '27. In the majority of cases, derived compositions are the result of intensive philological labor done *a posteriori* after the death of the author of the original composition. Let us call these *non-authorial* derivative compositions (or *non-authorial editions*). To mention only one example among many others, Antonio Gramsci wrote a copious number of letters during his detention in the years 1926-1937 because of his opposition to Fascism. The letters have been published several times since the second half of the '40s. The first edition (edited by Togliatti and Platone, Einaudi 1947) comprises 218 letters; the most recent (by Giasi, Einaudi 2020) 511 letters. One of the most read editions is due to Spriano (Einaudi 1971) and comprises only 156 letters. Spriano derived his edition from the one by Caprioglio and Fubini published in 1965 and presenting 428 letters. These are all non-authorial editions, which have not received the direct approval of Gramsci. For instance, it is up to editors to decide whether to present the letters chronologically, thematically or according to some other criteria.

To make sense of these considerations, our framework could be extended via the introduction of a *derivation* relation between compositions, $DER(c, c')$, simply telling that composition c derives from composition c' . With this new predicate, one could reconstruct “derivation chains” and say that the *original author* is the author of the first composition in the chain (assuming that the author is known). The authors of the other compositions in the chain can play other roles, e.g., translator, editor, copyist, etc. In some cases one does not have the original composition; e.g., one disposes only of several manuscripts. If a new edition is based on these manuscripts, one would have multiple chains ending up to the same edition, but often the motivation to consider the manuscripts pertain to the interpretative, not the derivative, dimension.

A first possibility is to see $DER(c, c')$ in a strict philological perspective, i.e., by analyzing c and c' exclusively in terms of “objective” transmission of linguistic *data*. DER is objective in the sense that there is a community sharing well established analytic tools; in this case differences between c and c' are to be attributed to involuntary mistakes produced by the transmission process. A second possibility is to take into account also the “content” of c and c' , i.e., the derivation is based on both historical and linguistic data, and the interpretations of c and c' ; differences between c and c' are to be attributed to voluntary actions of the transmitters. We introduce

here a subjective dimension to derivation; in particular, (d8) defines a socio-cultural derivation (eDER stands for *external derivation*; DER stands for derivation in the strict philological sense, as said above). One can also introduce a purely subjective view such as the view of the agent who produces the derived composition c , see (d9) (iDER for *internal derivation*), i.e., according to the author of c , compositions c and c' have the same content. The authorial-derivation is a specialization of iDER where the author of c is also the author of c' . Notice that the historical and linguistic similarities are ruled out from iDER which can be useful to model translations that however are often accompanied also by a socio-cultural acceptance of the translation itself (recall that translations are commonly only indirectly considered by philological analysis).

$$\mathbf{d8} \quad \text{eDER}(g, c, c') \triangleq \exists t(\text{AGR}(g, c, c', t)) \wedge \text{DER}(c, c')$$

$$\mathbf{d9} \quad \text{iDER}(a, c, c') \triangleq \exists t c''(\text{PRD}(a, c, t) \wedge \text{iAG}(a, c/c'', c'/c''))$$

Suppose now to have a composition produced following several derivation steps. For example, assume $\text{PRD}(a_0, c_0, t_0) \wedge \text{PRD}(a_1, c_1, t_1) \wedge \text{eDER}(g, c_1, c_0) \wedge \text{PRD}(a_2, c_2, t_2) \wedge \text{eDER}(g, c_2, c_1)$ (with $t_0 < t_1 < t_2$). This derivation chain represents the philological connection from the original composition c_0 to the final composition c_2 . In particular, in addition to historical and linguistic similarities, according to the group g , c_0 , c_1 , and c_2 have similar meanings. This derivation chain provides a specific view on c_2 , i.e., a philological view tracing back the origins of c_2 . One could presuppose that this, say, “origin-track” may influence the interpretations of c_2 . A composition can be seen therefore as dependent, in addition to the text, author and period, also to a specific origin-track (established by a_2 themselves or *a posteriori* by somebody else). In this perspective, a composition is a text *qua produced* by an agent at a certain time and *qua derived* following some specific chains. Given the fact that the origin-tracks of non-authorial editions (compositions) are socio-culturally grounded, non-authorial editions become in their turn *socio-cultural constructions* since they are meant to reflect their authors’ labor but are not the direct product of the authors of the original composition in the chain, and reflect editors’ purposes and editing methodologies. This view could be generalized considering that *each* published composition undergoes editorial processes; that is, each published composition (derived or not) is a socio-cultural construction resulting from the labor of multiple agents, i.e., authors and editors possibly in collaboration.

4. Literary Works as Socio-Cultural Constructions

On the basis of the framework presented in the previous section, we turn now to literary works. Following Thomasson [18], we have introduced compositions on the top of texts by considering as essential dimensions of compositions, but not of texts, both their authors and production periods (see (a2) and (a3) in Sect. 3) and, possibly, also their derivation-chain(s). A first possibility is to follow a similar strategy to introduce works, i.e., a work comes into existence when a group of agents agrees (in the sense of AGR) on the interpretation of a composition, it inheres in the composition and it specifically depends on the group. In this sense, a work is created only through a group-agreement and it emerges from the interpretation shared by members. This view is characterized via (a6) and (a7), where the predicate $\text{SD}(x, y)$ stands for ‘ x *specifically depends* on y ’, and $\text{w}(w)$ for ‘ w is a work’. By comparing (a2) and (a3) with (a6) and (a7), one can

notice that PRD and AGR play similar roles: compositions' existence is grounded on productions, while works' existence is grounded on group-agreements. However, while compositions are historically dependent on the authors of the texts in which they inhere, whenever a work exists, it (specifically) depends on the agreeing group. Notice that (a6) and (a7) do not rule out the possibility to have simultaneous works inhering in the same composition and depending on the same group. Such works would represent different perspectives on the composition shared by the members which can simultaneously provide several explanations for a composition highlighting alternative ways of interpreting it. In these cases, (a8) requires that some members of the group disagree at least on two explanations (provided by the members), i.e., the way the perspectives differ must be made evident by the provided explanations.¹²

$$\mathbf{a6} \quad \text{AGR}(g, c, t) \rightarrow \exists w(w(w) \wedge \text{EX}(w, t) \wedge \text{IN}(w, c) \wedge \text{SD}(w, g))$$

$$\mathbf{a7} \quad w(w) \wedge \text{EX}(w, t) \rightarrow \exists! gc(\text{IN}(w, c) \wedge \text{SD}(w, g) \wedge \text{AGR}(g, c, t))$$

$$\mathbf{a8} \quad w(w_1) \wedge w(w_2) \wedge w_1 \neq w_2 \wedge \text{EX}(w_1, t) \wedge \text{EX}(w_2, t) \wedge \text{IN}(w_1, c) \wedge \text{IN}(w_2, c) \wedge \text{SD}(w_1, g) \wedge \text{SD}(w_2, g) \\ \rightarrow \text{DISAG}(g, c, t)$$

It is worth stressing that, in this view, works do not carry an “objective” nature which agents grasp when reading compositions (which seems the view defended by Mizoguchi [9] in the applied ontology context). Works are *socio-cultural* entities that exist only with respect to specific groups interpreting compositions on the basis of their culture.¹³ Recall that the identity criteria for groups can be complex; e.g., it could be possible for a group to change its members through time [30, 31]. Also, the fact that there is a group agreeing on a composition does not prevent that, at the same time, other groups can disagree on the same composition.

Conceiving works in this manner has relevant consequences. That is, we cannot speak of, e.g., Orwell's *Animal Farm* as a single, self-standing work; we have as many *Animal Farm*'s works as collective interpretations of it. Furthermore, in this view works inhere in a single composition, therefore, for instance, the work that inheres in the original manuscript and the one that inheres in a translation are necessarily different.

One can embrace a more abstract view where works emerge from more complex (social) mechanisms and are linked to a multitude of compositions (rather than to a single one). By relying on the agreement of a group on the interpretation of different compositions, i.e., substituting the notion defined in (d5) with the one defined in (d6), one can assume a correspondence between works and maximal clusters of compositions that mutually satisfy the relation defined in (d6). In this view, works are still dependent on a group and a time, but they abstract from the compositions (and their texts and languages). Disagreements between groups would however still generate different works, i.e., a socio-cultural perspective on works is still present.

A philological perspective would require the compositions in the cluster corresponding to a work to be in a derivative relation: not only the compositions in the cluster must have an interpretation shared by the members of a group, but they also need to be philologically interlinked through derivation chains (which the compositions themselves can depend on).

¹²Axiom (a8) is weak. In particular, it does not guarantee that w_1 and w_2 are grounded on disjoint clusters of explanations on which all the members agree while disagreeing on explanations in different clusters. This stronger constraint can be characterized in our framework but it requires the introduction of several additional definitions.

¹³The reader can refer to [16] for references in philosophy about works as cultural entities.

5. Discussion and Conclusion

We have presented in the previous sections a modeling approach for literary works based on the notions of text and composition, both borrowed from Thomasson [18], as well as on the idea of meaning negotiation taken from Arrighi and Ferrario [22]. As said, a work corresponds in our approach to a composition as socially interpreted by a group of agents. From an ontological perspective, we model it as a *qua-entity* having as base a composition and as gloss the properties acquired through the negotiation process taking place among the members of the group who compare their individual interpretations to see whether they can reach an agreement about a shared interpretation. A work so understood is specifically dependent on a single composition; hence, it is not possible to associate the same work to multiple compositions.

In order to cover the cases of translations or alternative texts (e.g., a novel published by different publishers with some differences in the texts), we have proposed a second and more abstract notion of work obtained by clustering single compositions on the basis of some recognized similarity. What is relevant here is that a group of agents agrees on a common interpretation ascribed to multiple compositions. In both cases, the notions of work emerging from our analysis are inextricably socio-cultural in that they depend on agents' linguistic competences, knowledge, assumptions, and the information they use in support of their interpretations, among other criteria. We have also seen how our framework can deal with some typical scenarios in philology and book production relative to editorial practices. For instance, that the composition of a critical edition depends on both its original author (e.g., Gramsci), the compositions from which it has been derived and therefore their authors (e.g., in the role of copyist, editor). Future work is however required to tune the framework to more specific experts' requirements and modeling needs.

Let us now spend some words on the comparison between our approach and the state of the art, in particular, given the centrality of Thomasson's proposal [18] in our approach, with her notion of literary work. As said in Sect. 2, in Thomasson's view, works are the result of interpretation processes which agents perform on the basis of their interpretative cultures. Hence, by sharing similar cultures, different agents can interpret a composition in the same manner (although this is not necessarily the case). So, though apparently Thomasson's approach and ours are similar with respect to the centrality of interpretation, there is also a significant difference at a closer look. Thomasson's assumption is indeed that agents competent in a language and belonging to the same culture can interpret a composition in the same way (see [18, p. 160, footnote 13]). Disagreement about a composition may arise when the interpreting agents belong to remarkably different cultures or when the interpretation requires a specific background knowledge, which may vary among the members of a culture. Differently, we do not assume a sort of "agreement by default"; our starting point is that each individual agent has primarily a private understanding of a composition, and their interpretation is in principle different from that of other agents. Indeed, literary works are by definition open to interpretations: their polysemic nature, the ambiguity of their meaning, is one of the factors that distinguish literary texts from argumentative texts. It is only through an explicit social agreement, reached through a negotiation process, that a shared interpretation for a composition emerges. In other terms, while in Thomasson's view belonging to the same culture creates a

sort of tacit agreement in the interpretation of a composition, we build common interpretations through successive explicit agreements; this is similar to the building of a public meaning starting from private ones through iterative explicit negotiations as in Arrighi and Ferrario [22].

Finally, let us see if some aspects relative to the discussion about literary works can be generalized to the notion of information artifact in applied ontology.

The first aspect concerns the distinction between text and composition, which can be relevant – in our view – to claim, e.g., for copyrights or the official nature of documents. For instance, consider the difference between the text of a composition produced by a notary and documenting a deed sale, and a composition with the same text but produced by a person who lacks public authority. Clearly, only the first composition, because of the context of its production, counts as an official document and can be used for claiming property rights. To the best of our knowledge, the distinction between texts and compositions is not found in the applied ontology debate.

The second aspect concerns the notion of information artifact. As we have seen in Sect. 2, Mizoguchi’s [9] notion of *content* refers to a semi-abstract entity (existing in time but not in space) that a text captures. There is however no reference about interpretation processes at either the individual or social scale. At first glance, the assumption is that multiple agents can capture the same content out of multiple texts. With respect to the IAO, as said, the ontology talks of *information content entities* while actually referring to abstract patterns of characters. No reference to meanings, interpretations, semi-abstract contents is done. The approach could be useful to focus on texts (or compositions). It should be however clarified how the IAO can capture the semantic similarities of multiple texts, i.e., upon which principles texts can be clustered to claim that, e.g., they are alternative versions for the same novel.

It should be clear that there are evident points of departure between Mizoguchi, the IAO, and our approach, where “contents” are captured only indirectly through either individual or social agreements, as we have seen. Also, our approach may be tuned to Mizoguchi’s view assuming that introspective or social agreements capture extra-linguistic meanings. At first glance, considering the modeling of texts and compositions, we do cover the IAO’s view, too. To sum up, from a general perspective, our approach allows taking into account multiple dimensions relative to the ontology of information artifacts (i.e., texts, compositions, individual and social interpretations) while stressing their socio-cultural nature. The topic is however challenging and there is still plenty of work to be done. For instance, recall that information artifacts are used to model a great variety of entities, including figures and softwares. We need to verify whether our proposal can model these entities as well. On the other hand, it may be possible that ontologists have used the same notion to actually mean different things, in which case there may not be a unique, single notion of information artifact capturing all these entities [10]. In this sense, a pluralistic approach would be needed.

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