Are there iterated essentialist truths?

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An iterated essentialist statement is a statement like 'It lies in the nature of Socrates that it lies in the nature of Socrates that he is human'. Let us write $\Box_{t_1,t_2...}\phi$ for 'It lies in the (collective) nature of $t_1, t_2, \ldots$ that ϕ'.[1] Here $t_1, t_2, \ldots$ can be terms of any grammatical category, such as names, sentential operators, predicates, sentences, etc.[2] For present purposes, we will understand an iterated essentialist statement to be a statement of the form $\Box_{t_1,t_2,...}\Box_{t_1',t_2',...}\phi$. Let *Iteration* be the thesis that there are true iterated essentialist statements. Iteration has recently been disputed by Shamik Dasgupta (2014) and Martin Glazier (2017). Both authors take the falsity of Iteration to be central to the explanatory role of essentialist truths. An important consequence that is not explicitly noted by Dasgupta or Glazier is that the falsity of Iteration would entail that metaphysical necessity is not reducible to essence in the manner suggested by Fine (1994). According to Fine, for a proposition

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[1] I will use each of the following expressions interchangeably: (i) it lies in the (collective) nature of ... that; (ii) it is true in virtue of the (collective) nature of ... that; (iii) it is essential to ... (taken together) that. The idea of using subscripted operators to express essentialist statements is due to Kit Fine; see Fine (1995a,b).

[2] We can make this precise by working in a higher-order language based on a simple theory of types. In such a language, every term is assigned a type based on a hierarchy of types specified as follows: e is a type (the type of individuals), and for $n \geq 0$, if $\sigma_1, \ldots, \sigma_n$ are types, then $\langle \sigma_1, \ldots, \sigma_n \rangle$ is a type (the type of relations between entities of type $\sigma_1, \ldots, \sigma_n$, with $\langle \rangle$ being the type of propositions). For example, negation ($\neg$) is a term of type $\langle \langle \rangle \rangle$, and the predicate 'is human' is a term of type $\langle e \rangle$. For every sequence of types $\sigma_1, \ldots, \sigma_n$, there is an essentialist operator $\Box_{\sigma_1,\ldots,\sigma_n}$, of type $\langle \sigma_1, \ldots, \sigma_n, \langle \rangle \rangle$. Essentialist operators thus combine with a sequence of terms of specified types and a formula to make a formula. For simplicity I here confine myself to the explicit formal representation of essentialist statements in which the subject of the essentialist attribution is a finite collection of entities. It is straightforward to generalize the formalization to infinite collections; see Fine (1995a) for a generalization to infinite collections of objects and Ditter (2022) for a generalization to infinite collections of entities of arbitrary types. In the text I will proceed informally.

to be metaphysically necessary is for it to be true in virtue of the nature of all objects. If Iteration is false, then there are no true claims of the form 'It is true in virtue of the nature of all objects that it is true in virtue of the nature of all objects that ϕ'. But if truth in virtue of the nature of all objects just is metaphysical necessity (or is at least necessarily coextensive with metaphysical necessity), then there will be iterated truths involving it, since there are iterated truths of necessity.[3] This paper defends Iteration against the challenges presented by Dasgupta and Glazier, drawing attention to some features of the collective essences of properties, propositions, and logical operations that have been largely neglected in discussions about essence.

1 Arguments for Iteration

Since the question of whether Iteration is true has received very little attention in the literature, it will be worth beginning our discussion by briefly considering two arguments for Iteration.[4]

Argument 1 It is natural to suppose that many essential truths are true in virtue of their own nature.[5] (In symbols, p is true in virtue of its own nature if $\Box_p p$.) For example, the truth that everything is self-identical plausibly flows from the very nature of the proposition that everything is self-identical ($\Box_{\forall x(x=x)} \forall x(x=x)$), and similarly for the truth that all red things are colored. Call a proposition that is true in virtue of its own nature *intrinsically necessary*. At least *prima facie*, the propositions expressed by the broadly logical principles encoded in a logic of essence—the *theorems* of the logic—would be prime candidates for being intrinsically necessary. This motivates the following essentialist rule of necessitation:

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[3]Especially if we adopt the standard view that the logic of metaphysical necessity includes all the theorems of S4.

[4]These arguments are of course not intended as a comprehensive defense of Iteration. Ditter (2022) presents more systematic versions of the arguments below in the context of a higher-order logic of essence.

[5]Though it is controversial whether *all* essential truths enjoy this status. See Ditter (2022, §3.3) for arguments to the contrary.

(RN) If ϕ is a theorem, then $\square_\phi \phi$ is a theorem

Given a classical background logic, (RN) immediately implies that $\square_{\forall x(x=x)} \forall x(x=x)$ is a theorem. An application of (RN) to this theorem in turn yields $\square_{\square_{\forall x(x=x)} \forall x(x=x)} \square_{\forall x(x=x)} \forall x(x=x)$ as a theorem. Since a sentence is a theorem only if it is true, this is an instance of Iteration.

A closely related principle says that every closed theorem[6] ϕ is true in virtue of the collective nature of the entities denoted by the constants occurring in ϕ. Formally:

(RN*) If ϕ is a closed theorem, then $\square_{A_1,\ldots,A_n} \phi$ is a theorem, provided $A_1,\ldots,A_n$ are all the constants occurring in ϕ

Given a classical background logic, (RN*) immediately implies the plausible claim that it is true in virtue of the nature of universality ($\forall$) and identity that everything is self-identical ($\square_{\forall,=} \forall x(x=x)$). Another application of (RN*) then yields the theorem $\square_{\square,\forall,=} \square_{\forall,=} \forall x(x=x)$,[7] and thus another instance of Iteration.

Argument 2 Let an essentialist truth be a truth of the form $\square_{t_1,\ldots,t_n} \phi$. Suppose it is essential to x that p. Then, by the standard assumption that essentialist truths are necessarily true if true at all, it is necessary that it is essential to x that p; entities cannot lose any of their essence.[8] The necessity of essentialist truths can be systematically explained with the help of the following essentialist principle:[9]

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[6]A closed theorem is a theorem without free variables.

[7]Strictly speaking, the essentialist operator abbreviated by $\square$ in this formula is the operator $\square_{\langle\langle e\rangle\rangle,\langle e,e\rangle}$; see footnote 2. I will continue to omit type annotations in the text.

[8]See, e.g., Kripke (1980, p. 159). This standard assumption, along with the related principle (invoked below) that essence implies necessity, has recently been doubted by a number of authors; see Casullo (2020), Mackie (2020), Noonan (2018), Leech (2021), Romero (2019); see Bovey (2022) and Wallner and Vaidya (2020) for discussion. Note also that the assumption that essentialist truths are necessary will be rejected by contingentists like Stalnaker (2003) who accept what Williamson (2013, ch. 4) calls the *Being Constraint*—the principle that necessarily, everything is such that, necessarily, it has a property only if it is something—since these two assumptions together entail necessitism. However, contingentists who accept the Being Constraint may still want to endorse the qualified principle that essentialist truths whose subjects are necessary existents are necessarily true if true at all. They can thus take (4) in the text, restricted to necessary existents, to offer an explanation of the qualified principle.

[9]In all labeled principles below, we take any free variables to be bound by a tacit initial universal quantifier prefix.

(4)　$\Box_{x_1,\dots,x_n} p \to \Box_{\Box,x_1,\dots,x_n} \Box_{x_1,\dots,x_n} p$

The principle says that that if it is essential to $x_1,\dots,x_n$ that p, then it is essential to $x_1,\dots,x_n$ *together with essentiality* (i.e. what is expressed by the essentialist operator) that it is essential to $x_1,\dots,x_n$ that p. Together with the widely accepted principle that essence implies necessity—i.e. what is true in virtue of the nature of some things is necessarily true—(4) implies that every essentialist truth is necessarily true: if $\Box_{x_1,\dots,x_n} p$, then necessarily, $\Box_{x_1,\dots,x_n} p$. Principle (4) implies an instance of Iteration for every essentialist truth. Part of the motivation for the specific form of (4) stems from the idea that the necessity of an essentialist truth flows at least in part from the nature of essentiality itself.

Let me highlight some central, and perhaps unfamiliar, features of the instances of Iteration entailed by these arguments: (i) The instances of Iteration entailed by (RN) concern the essences of *propositions*, or more specifically, the essences of essentialist truths. (ii) The subjects of the essentialist attributions entailed by (RN*) and (4) consist of more than one entity: each of these iterated essentialist claims is of the form $\Box_{s_1,\dots,s_n} \Box_{t_1,\dots,t_m} \phi$ with $n \geq 2$; furthermore, the collective subjects of these essentialist attributions include essentiality: each of these iterated essentialist claims attributes something to the nature of essentiality considered in conjunction with other entities.

2　Arguments against Iteration

Let me now turn to the aforementioned arguments against Iteration. Dasgupta (2014) has recently put forward the view that essentialist facts are *autonomous*, i.e. not apt for being grounded, and defended it against the following objection (ibid.: p. 591).

Suppose the following two principles are true:[10]

(E4)　$\Box_x p \to \Box_x \Box_x p$

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[10](E4) is a theorem of Fine's logic of essence (LE); see Fine (1995a, 2000).

[Read: If it is essential to x that p, then it is essential to x that it is essential to x that p.]

(Essential Grounding) $\Box_x p \rightarrow (p \text{ because } \Box_x p)$

[Read: If it is essential to x that p, then p because it is essential to x that p.[11]]

We can then first conclude, by (E4), from the premise that it is essential to x that p that it is essential to x that it is essential to x that p. Essential Grounding then entails that it is essential to x that p *because* it is essential to x that it is essential to x that p. The argument would entail that every essentialist fact is grounded in an iterated essentialist fact; so no essentialist fact is autonomous.

To avoid this conclusion, Dasgupta denies (E4). He points out that while (E4) is a theorem of Fine's logic of essence (LE), this logic was developed to govern *consequential* essence, a notion of essence that is closed under logical consequence. And it is not obvious that (E4) holds for the basic, non-consequential notion which Dasgupta, following Fine (1995b), calls *constitutive* essence. According to Dasgupta,

> To state the constitutive essence of Socrates might require stating that he is human. But it is odd to think that his essential core also includes the fact that it is part of his essential core that he is human. This latter, iterated claim of essence is something that follows from (or is grounded in) his essential core and not part of the essential core itself. (Dasgupta, 2014, p. 591)

The particular case judgment in the quoted passage is plausible as far as it goes. However, if the aim of the argument is not only to establish that there are counterexamples to (E4), but also—as it seems to be—to rebut an objection to the thesis that all essentialist facts are autonomous, then denying (E4) is insufficient, because the invalidity of the schema is consistent with there being iterated essentialist truths; and given Essential Grounding, even one such truth suffices for the conclusion that not all essentialist facts are autonomous. While

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[11]The principle is due to Rosen (2010).

appealing to a principle like (E4) is one way of deriving iterated essentialist claims, it is by no means the only way, as pointed out in §1. In fact, none of the arguments for Iteration in §1 appealed to (E4).

It bears emphasis that the principle (E4) differs in a crucial respect from (4) above: the latter has a collective subject including essentiality in the essentialist attribution in the consequent, whereas the former has a single subject. Given (4), Socrates' being essentially human ($\Box_s\text{Human}(s)$) merely entails that it is essential to Socrates and essentiality *taken together* that Socrates is essentially human ($\Box_{s,\Box}\Box_s\text{Human}(s)$), whereas given (E4) it entails that it is essential to Socrates *alone* that he is essentially human ($\Box_s\Box_s\text{Human}(s)$). The truth of $\Box_s\Box_s\text{Human}(s)$ can be plausibly denied on the grounds that Socrates' essence does not involve essentiality—essentiality does not "figure" in his essence.[12] But the situation changes once we add essentiality to the subject of the outer essentialist operator, as in $\Box_{s,\Box}\Box_s\text{Human}(s)$, since essentiality *does* plausibly figure in the collective essence of Socrates and essentiality. It is not at all obvious that the intuitive considerations that speak against the truth of $\Box_s\Box_s\text{Human}(s)$ bear much weight against claims like $\Box_{s,\Box}\Box_s\text{Human}(s)$ or $\Box_{\Box,\forall,=}\Box_{\forall,=}\forall x(x=x)$, or against the general principles (RN*) and (4) from which these claims can be derived. The focus on (E4) in arguing against Iteration and for the thesis that all essentialist truths are autonomous would thus seem to be a red herring.

Unlike Dasgputa, Glazier (2017) wants to allow for essentialist truths to be grounded. According to Glazier, the problem with iterated essentialist truths is that they are in conflict with what he calls the 'ultimacy of essentialist explanation'. An essentialist explanation in Glazier's sense is an explanation in which a given fact *p* is explained by the fact that a certain thing is essentially such that *p* (p. 2872). The ultimacy of essentialist explanation

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[12]A natural way of making this notion of essential involvement precise is as follows: The (collective) essence of $x_1,\ldots,x_n$ involves *y* if and only if there is some property *P* such that it lies in the nature of $x_1,\ldots,x_n$ that *P* applies to *y*; in symbols, $\exists P\Box_{x_1,\ldots,x_n}P(y)$. This definition depends for its adequacy on the principle of β-conversion; see Ditter (2022). Another way of understanding essential involvement would be to invoke the notion of propositional constituency; see the discussion of Glazier's argument below.

then consists in there being no essentialist explanation such that there is an essentialist explanation of its explanans. Glazier defends the ultimacy of essentialist explanation by defending another principle, which he calls 'the inessentiality of essence' (p. 2885):

(IE) $\neg\exists x\exists y\exists p\Box_x\Box_y p$

[Read: There are no x, y and p such that it is essential to x that it is essential to y that p.]

(IE) immediately entails that there are no iterated essentialist truths with single (i.e. non-collective) subjects. Although Glazier only explicitly argues for (IE), he notes that a generalization of (IE) and the ultimacy of essentialist explanation to collective essences can also be defended (p. 2887 *n*. 28). The generalization of (IE) to collective essences can be expressed by the following schema:

(GIE) $\neg\exists x_1\ldots\exists x_k\exists y_1\ldots\exists y_n\exists p\Box_{x_1,\ldots,x_k}\Box_{y_1,\ldots,y_n}p$, where $k,n \geq 1$

[Read: There are no $x_1,\ldots,x_k, y_1,\ldots,y_n$ ($k,n \geq 1$) and p such that it is essential to $x_1,\ldots,x_k$ (taken together) that it is essential to $y_1,\ldots,y_n$ (taken together) that p.]

Glazier first provides an intuitive argument similar to Dasgupta's argument against (E4) discussed above for the case of (IE) in which the iteration involves a single subject, and then goes on to argue that the case in which the subjects are distinct is even more straightforward:

> Suppose now that s and t are distinct. Can it be the case that $\Box_s\Box_t\phi$? If we never have $\Box_t\Box_t\phi$, it is even more clear that that we never have $\Box_s\Box_t\phi$. For if $\Box_t\phi$ does not even lie in the nature of t itself, how could it lie in the nature of some *other* thing? If $\Box_t\phi$ is outside the core even of t itself, so to speak, it is still further outside the core of what is distinct from t. And so it seems we cannot have $\Box_s\Box_t\phi$. (ibid. p. 2886, notation adapted)

But the considerations adduced in Argument 1 for the existence of intrinsically necessary essentialist truths have already provided a principled way to answer Glazier's questions in

the passage just quoted: If, for example, $\Box_{\forall x(x=x)}\forall x(x=x)$ is intrinsically necessary, then $\Box_{\Box_{\forall x(x=x)}\forall x(x=x)\Box_{\forall x(x=x)}\forall x(x=x)}$ is a truth of the form $\Box_s\Box_t\phi$ with $s \neq t$. Moreover, we have already seen in our discussion of Dasgupta's argument that intuitive considerations against truths of the form $\Box_t\Box_t\phi$ do not generalize to certain iterated essentialist claims with *collective* subjects, such as $\Box_{\Box,\forall,=}\Box_{\forall,=}\forall x(x=x)$ or $\Box_{s,\Box}\Box_s\mathrm{Human}(s)$. Taken together, these examples suggest a general answer to Glazier's question in the quoted passage about how iterations involving different subjects could be true: (i) essentialist truths may themselves be intrinsically necessary; or (ii) the subject of the inner essentialist operator might be a proper sub-collection of the subject of the outer essentialist operator, and the latter might include essentiality as a subject.

I conclude that Glazier's intuitive argument for (IE) does not provide good reasons for questioning Iteration. But he offers another, more systematic argument. The argument assumes the principle that 'sources are constituents', which Glazier takes to be independently plausible (p. 2887):[13]

(SC) If $\Box_x p$, then x is a (Russellian) constituent of the structured proposition p.

Given (SC), he argues that we can never have $\Box_x\Box_y p$ for distinct x and y. He argues as follows. Suppose x and y are distinct and that p is a proposition such that $\Box_x\Box_y p$. Then by (SC), x must be a constituent of $\Box_y p$. According to Glazier, there are two cases to consider: (i) x is a constituent of p; (ii) x is the essentialist operation $\Box$.[14] Suppose first that x is a constituent of p. From $\Box_x\Box_y p$ it follows that $\Box_y p$, by the factivity of essence. So the essence of y involves x. (In Glazier's terminology, the essence of x involves y just

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[13]Wilsch (2017) also argues for a version of (SC), which he calls the 'bearer-constraint', though he doesn't explicitly appeal to Russellian structured propositions but only requires that if $\Box_x p$, then x "occur" in the proposition p.

[14]Glazier doesn't consider the possibility that x a constituent of y. It is unclear why, since if x could be a constituent of p, it would be natural to assume that x could also be a constituent of y, for example if y just is p. Moreover, if propositional constituency is irreflexive, then there is an additional case to be considered, *viz.* that x is identical to p; since if the essentialist operation $\Box$ is supposed to be a constituent of the proposition $\Box_x p$, as Glazier assumes, then the proposition p would also seem to be a constituent.

in case y is a constituent of a proposition that is essential to x (Glazier, 2017, p. 2887).)
Furthermore, it follows from the assumption $\Box_x\Box_y p$ that the essence of x involves y (because y is a constituent of $\Box_y p$). Thus the essence of y involves x and the essence of x involves y. However, Glazier argues:

> [T]here is a powerful reason to think that such "reciprocal essences" are impossible. To say that a thing is by its very nature a certain way, or is essentially a certain way, is to give a partial "real definition" of that thing, in the sense of an explanatory account of what the thing is. (...) Reciprocal essences therefore lead to circular explanation. If the essence of y involves x and vice versa, then what y is may be explained in terms of x and vice versa. But no explanation can be circular in this way. (ibid., notation adapted)

Glazier eschews the remaining possibility of x being the essentialist operation (essentiality) on the following grounds. By the above argument, x cannot be a constituent of p, and by assumption, x is distinct from y. So $\Box_y p$ claims that a proposition of which essentiality is not a constituent lies in the nature of something other than essentiality. And Glazier holds that it is implausible that any such claim can be true in virtue of the nature of essentiality. (ibid.)

But Glazier's systematic argument for (IE) is problematic, since (SC) alone seems to be in tension with the principle that reciprocal essences are impossible, in which case Glazier's argument would fail on its own terms.[15] Note first that if propositional constituency is irreflexive (i.e. no proposition is a constituent of itself), then (SC) entails that there are no truths of the form $\Box_\phi \phi$, and thus no intrinsically necessary truths. This strikes me as an extremely implausible consequence. So the only plausible way to maintain (SC) would be

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[15]I will set aside the problem that it relies on a theory of (Russellian) structured propositions which is arguably inconsistent, due to the 'Russell-Myhill antinomy'. For recent discussions of its implications for theories of structured propositions, see Goodman (2017); Dorr (2016); Fritz et al. (2021); Uzquiano (2015). Glazier's argument arguably only depends on *some* way of making sense of propositions having constituents in a non-trivial way, i.e. such that not all propositions have exactly the same constituents, and we can grant for the sake of argument that we can indeed make sense of this.

either to take every proposition to be a constituent of itself (because, plausibly, either all propositions are constituents of themselves or none are), or to weaken (SC) as follows:

(SC*) If $\square_x p$, then x is either a (Russellian) constituent of, or identical to, the structured proposition p.

Either way, $\square_x p$ would entail that the essence of x involves p.[16] And from this we can argue that (SC) *alone* leads to violations of the principle that reciprocal essences are impossible (and similarly for (SC*)). For suppose that for some x and p, we have $\square_x p$, and suppose that x is a constituent of p (we can take $\square_x p$ to be $\square_s \text{Human}(s)$, for example). Then the essence of x involves p. Now let q be some proposition true in virtue of the nature of p (in symbols: $\square_p q$). By (SC), it follows that p is a constituent of q.[17] But by hypothesis, x is a constituent of p, so x is a constituent of q as well, if we assume that the relation of being a constituent is transitive.[18] So the essence of x involves p and the essence of p involves x, contradicting the principle that reciprocal essences are impossible. Thus Glazier's systematic argument for (IE) cannot get off the ground.

One might try to resist this argument by holding on to (SC) in conjunction with the irreflexivity of propositional constituency (and therefore reject the existence of intrinsically necessary truths). But this will not suffice to block the argument that (SC) leads to violations of the principle that reciprocal essences are impossible. For we can run a slightly modified version of the argument in the previous paragraph. Suppose that for some x and p, x is a constituent of p and $\square_x \neg p$.[19] Then the essence of x involves p, because p is a constituent of

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[16]If (SC*) were adopted, we would also have to modify the definition of essential involvement as follows: the essence of x involves y just in case y is a constituent of, or identical to, a proposition that is essential to x. The modification is necessary to ensure that (SC*) tracks essential involvement in the same way as (SC) does.

[17]Given (SC*) it only follows that p is either a constituent of, or identical to, q. The argument still goes through, since given that x is a constituent of p and q is true in virtue of the nature of p, the assumption that p is identical to q entails that the essence of p involves x.

[18]We can avoid the assumption of transitivity and assume instead that propositions have their constituents essentially—an assumption that is extremely plausible on a structured conception of propositions. In the present case, this would mean that it is essential to p that x is a constituent of p, which straightforwardly entails that the essence of p involves x on Glazier's understanding of essential involvement.

[19]The use of a negated proposition is inessential here. We could have used some other proposition expressed

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$\neg p$. If we now assume that for some q, $\square_p q$, then we can argue as before to the conclusion that the essence of x involves p and the essence of p involves x.[20]

3   Conclusion

I have argued that the arguments that have been mounted against Iteration do not withstand scrutiny: They either fail to generalize in the required way or fail on their own terms. The arguments may look plausible if we only consider the essences of concrete individuals like Socrates, but lose much of their force once we take into account the essences of properties, propositions and logical operations, considered both individually and collectively. Some philosophers may be inclined to take the question of whether Iteration is true to be merely verbal: There is a sense of essence for which Iteration is true, and there is a sense for which it is false. However, such an attitude neglects the fact that the question of whether Iteration is true arises for any reasonable notion of essence. And as far as I can see, the considerations in support of Iteration adduced here did not rely on any assumptions that are obviously false for *any* such notion.[21]

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by a complex sentence instead. What matters is that p should be a constituent of the proposition in question.

[20]It is worth noting that, given plausible auxiliary assumptions, violations of the principle that reciprocal essences are impossible can be similarly derived from the reflexivity of essential involvement—the claim that for every x, there is some proposition true in virtue of the nature of x which contains x as a constituent. Given that every entity has an essence, this assumption is considerably weaker than (SC), as it does not require an entity to be a constituent of *every* proposition essential to the entity.

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