Engineering Existence?

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Abstract

This paper investigates the connection between two recent trends in philosophy: higher-orderism and conceptual engineering. Higher-orderists use higher-order quantifiers (in particular quantifiers binding variables occupying the syntactic positions of predicates) to express certain key metaphysical doctrines, such as the claim that there are properties. I argue that, on a natural construal, the higher-orderist approach involves an engineering project concerning, among others, the concept of existence. I distinguish between a modest construal of this project, on which it aims at engineering higher-order analogs of the familiar notion of first-order existence, and an ambitious construal, on which it additionally aims at engineering a broadened notion of existence that subsumes first-order and higher-order existence. After identifying a substantial problem for the ambitious project, I investigate a possible response which is based on adopting a cumulative type theory as the background higher-order logic. While effective against the problem at hand, this strategy turns out to undermine a major reason to embrace higher-orderism in the first place, namely the idea that higher-orderism serves to dissolve a range of otherwise intractable debates in metaphysics. Higher-orderists are therefore best advised to pursue their engineering project on the modest variant and against the background of standard type theory.

Keywords: Higher-Order Logic, Higher-Order Quantification, Conceptual Engineering, Pluralism, Existence, Type Theories

1 Higher-Orderism as Quantificational Pluralism

This paper investigates the connection between two recent trends in philosophy: higher-orderism (which, as we shall see shortly, can be regarded as a form of quantificational pluralism) and conceptual engineering. Higher-orderists maintain that a large variety of debates in theoretical philosophy profit from being formulated in a higher-order language: a language that allows not only for first-order quantification, i.e. quantification into the position of singular terms, but also for higher-order quantification, in particular quantification into the position of predicates. The debates to which such higher-order resources have been applied include that about absolute generality (Williamson 2003), that between internalists and externalists about meaning (Besson 2009), that between necessitists and contingentists (Stalnaker 2012; Williamson 2013; Fritz and Goodman 2017), as well as those surrounding the notions of identity (Rayo 2013; Dorr 2016), essence (Correia 2006), and grounding (Correia and Skiles 2019; Fritz 2019, 2021).[1]

All of these approaches can be seen as advancing a higher-order conception of properties (and propositions, which can be conceived of as zero-place properties) which is then applied to the more specific debate at hand. Given its centrality to higher-orderist projects, the higher-order conception of properties (defended extensively in Jones 2018 and Trueman 2021b) serves as a natural focal point for an investigation into the connection between higher-orderism and conceptual engineering. It is best introduced by contrast with the more familiar first-order conception of properties: first-orderists take properties to be the referents of certain singular terms, such as 'the property of being red' and 'redness'. Accordingly, when first-orderists conclude from the assumption that apple a and apple b are both red, '$Ra \wedge Rb$', that the two apples share a property, they use a first-order quantifier (binding variables in singular term position) to capture this conclusion with a claim such as '$\exists x$(a instantiates $x \wedge b$ instantiates x)'. In contrast, higher-orderists about properties take properties to be whatever predicates, such as e.g. ' ... is red', stand for. When they infer from '$Ra \wedge Rb$' that a and b share a property, they use a higher-order quantifier (binding variables in predicate position) to formulate this conclusion as '$\exists X(Xa \wedge Xb)$'.[2]

The motivations for higher-orderism about properties are multifarious. The consideration that will be most important for the purposes of this paper is that by conceiving of properties as higher-order entities the obligation to engage with certain intractable questions concerning their nature can be avoided. The questions to be eschewed include the question whether properties are spatiotemporally located (Jones 2018, 817-825; Trueman 2021b, 133-137), the question whether properties are sets (Jones 2019, 172)[3] and the question whether properties need to be connected to objects by an instantiation relation, a question which famously serves as the starting point for Bradley's regress (Trueman 2021b, 126-133). From the perspective of first-orderists, who take properties to be the referents of singular

[1]For an overview of some recent applications of higher-order resources to debates in metaphysics see Skiba forthcoming.

[2]An important difference between first-order and higher-order conceptions of properties is that proponents of the latter can regard our example inferences as *logical* inferences (see Jones 2018): the conclusion follows from the premise via an application of the inference rule of higher-order existential generalization.

[3]Jones makes the last point about propositions but it equally applies to properties. Indeed, given that higher-orderists regard propositions as zero-place properties, propositions are a special case of properties.

terms, these questions make perfect sense. They therefore demand a response. But from the perspective of higher-orderists, who take predicates to be the right linguistic vehicles to facilitate talk about properties, there are no intelligible questions to be asked here: the expressions '... is located at the coordinates t, x, y, z' , '... is a set', and '... instantiates —' are each most naturally construed as combinable only with singular terms, not with predicates. So from the perspective of higher-orderists, the problematic questions cannot even be intelligibly formulated, which provides them with a formidable excuse for avoiding the agonizing task of trying to answer them.[4]

Following Jones we can call such arguments for higher-orderism *arguments from dissolution* (the idea being that problematic debates are *dissolved*, rather than *resolved*). Arguments from dissolution bring out an important feature of higher-orderism: its proponents regard higher-order quantification as a *sui generis* form of quantification, i.e. a form of quantification that is neither reducible to nor fully explicable in first-order terms.[5] If it wasn't for this feature, dissolution arguments would be non-starters. If higher-order quantification was, e.g., regarded as a disguised first-order quantification over sets, as proposed by Quine (1970), higher-order claims about properties would become notational variants of first-order claims about sets. In that case, anything that can intelligibly be asked about sets can intelligibly be asked about properties, undermining dissolution arguments from the get-go. Higher-orderists can thus be seen as advocating a form of pluralism about quantification: according to them, quantification into singular term position ($\exists x ... x ...$) and quantification into predicate position ($\exists X ... X ...$) are both fully legitimate and self-standing types of quantification none of which can be reduced to, or eliminated in favor of, the other.

Higher-orderism is not the *only* view which could reasonably be associated with the title 'quantificational pluralism'. Other candidates for this label include the ontological pluralism advocated by Turner (2010, 2021) and McDaniel (2009, 2013, 2017), the quantifier variantism advanced by Hirsch (2011), and the pluralism about non-being defended by Bernstein (2021). We don't need to decide which of these positions is the *best* candidate for our label (we may be pluralists about quantificational pluralism) and a detailed comparison, while fascinating, will have to wait for another occasion. What is important, though, is that all of these

[4]A further, somewhat more involved argument from dissolution is provided in Skiba 2020 where it is argued that higher-orderism helps to dissolve the dispute between trope theorists and proponents of universals. For a different take on higher-orderism's impact on this dispute see Jones 2018, §5.

[5]For discussion and defense of this conception of higher-order quantification see Prior 1971, Ch. 3; Rayo and Yablo 2001; Rayo and Williamson 2003; Williamson 2003: §9, 2013: Ch. 5, §9; MacBride 2006, 444-447; Wright 2007.

alternative positions differ from higher-orderism in that they are better described as pluralists about first-order being, than as pluralists about orders of being: they can all be seen as advocating a pluralism about first-order quantification, distinguishing between several irreducible quantifiers into the position of singular terms ($\exists_1 x ... x ...$ vs. $\exists_2 x ... x ...$), rather than as advocating a pluralism about quantifiers binding variables of distinct syntactical types ($\exists x ... x ...$ vs. $\exists X ... X ...$).

So far, we have focussed only on an initial segment of the higher-orderists' bigger metaphysical picture. Thus, we have restricted our attention to first-level predicates, i.e. predicates such as '... is red' which combine with singular terms to form a sentence, and the corresponding higher-order quantifiers, i.e. second-order quantifiers which bind variables in the syntactic position of these first-level predicates. But the remit of higher-order quantification is broader than that. In analogy to first-level predicates, second-level predicates are predicates which combine with first-level predicates to form a sentence, and higher-orderists recognize corresponding higher-order quantifiers, i.e. third-order quantifiers which bind variables in the syntactic position of these second-level predicates.[6] And just like higher-orderists take second-order quantification to be irreducible to first-order quantification, so they take third-order quantification to be irreducible to quantification of any lower order. More generally, higher-orderists usually accept (at least) as many orders of quantification as there are natural numbers and regard the quantifiers of n-th order to be irreducible to quantifiers of an order lower than n. We will mostly focus on the bottom two levels of the infinite hierarchy this conception of higher-order quantification gives rise to: level 0, comprised of the possible semantic values of singular terms (and corresponding variables), i.e. the entities ranged over by first-order quantifiers. And level 1, comprised of the possible values of first-level predicates (and corresponding variables), i.e. the entities ranged over by second-order quantifiers. Sometimes, however, it will be important to have the full metaphysical picture in mind.

In the following, I will explore some connections between higher-orderism, understood in the way described, and the recent debate on conceptual engineering. As we will see shortly, there are some striking similarities between the way higher-orderists think about the philosophical enterprise they engage in and the way conceptual engineers conceive of their undertakings. Despite this proximity, and despite the recent surge of interest in each of the two individual fields of research, the two debates have so far developed in isolation from one another. In the following, my aim will be to begin to bring these two debates into contact, in

[6]For simplicity, I am restricting attention to monadic predicates and the corresponding quantifiers.

the hope to thereby enhance our understanding of both of them.

More specifically, the plan for this paper is as follows: in §2, I argue that, on a natural construal, the higher-orderist approach involves an engineering project concerning a range of key logico-metaphysical concepts, including those of existence, identity, property and proposition. I distinguish between two ways of understanding this engineering project: on the modest variant, it aims at engineering higher-order *analogues* of these familiar first-order concepts; on the ambitious variant, it additionally aims at engineering *broadenings* of these notion which subsume both the first-order concepts as well as their higher-order analogues. Focussing on the case of existence, I then investigate the prospects of the ambitious projects and identify, in §3, a substantial problem for it: the quantificational pluralism at the heart of higher-orderism thwarts the attempt to introduce a broadened notion of existence by way of disjoining more specific ones. In §4, I discuss an attempt to save the ambitious project by adopting a cumulative type theory as the background higher-order logic. I argue that this may help to avoid the problem at hand, but only at the expense of undermining dissolution arguments for higher-orderism and with them a major reason to embrace higher-orderism in the first place. In §5, I therefore conclude that higher-orderists are better off pursuing their engineering project on the modest variant and against the background of standard type theory and discuss the prospects of the engineering project thus conceived.

2 Higher-Orderism and Conceptual Engineering

Higher-orderists about properties tend to view themselves as advocating a form of property realism. What justifies this self-assessment? After all, to be a realist about some entities is usually taken to require believing in the *existence* of the entities in question. But higher-orderists regard predicates as the appropriate linguistic vehicles to talk about properties, and predicates don't allow for meaningful combination with 'exists': unlike 'redness exists', 'is red exists' is ungrammatical.

When confronted with such challenges, higher-orderists tend to suggest that our conceptual apparatus is more flexible than the grammar of natural languages. Thus, Trueman doesn't want to dispute that natural language claims involving existence-locutions are best formalized with the help of the first-order quantifier '$\exists x ... x ...$'. Rather, his aim is 'to challenge [...] the idea that the notion of existence expressed by $\exists x ... x ...$ is the *only* notion of existence' (2021b, 1). He thinks that '$\exists X ... X ...$' should be seen as expressing a notion of existence too, even if we don't use the English word 'exists' to express that notion. Similarly, Jones is aware that 'we cannot in English, attribute existence to the predicational aspects of reality generalized by second-order sentences [containing e.g. "$\exists X ... X ...$"]' (2018, 816). However, he does not take this to stand in the way of us making a 'semantic decision' (ibid.) as a result of which we may legitimately regard '$\exists X ... X ...$' as expressing a notion of existence too.

Trueman and Jones are thus not interested, primarily at least, in descriptive claims about how we in fact talk and reason about existence. Rather, they are making a normative claim, characteristic of conceptual engineering projects, namely that we *ought* to recognize '$\exists X ... X ...$' as capturing a notion of existence. What is more, the reasons they give for this recommendation are similar to those given in paradigmatic engineering projects. Thus, Trueman and Jones stress the theoretical fruitfulness of recognizing '$\exists X ... X ...$' as expressing a notion of existence: it is what allows us to frame a realist theory of properties in higher-order terms which in turn is supposed to deliver a range of major theoretical pay-offs, a prime example of which being the dissolution of a variety of otherwise intractable problems in the metaphysics of properties we considered in §1.

These observations already provide some initial evidence for regarding the higher-orderists' enterprise as involving some form of engineering project with respect to the concept of existence (and further evidence will emerge as we go along). If this initial impression is correct, it is natural to ask: what *exactly* does the engineering project consist in? What *exactly* are higher-orderists trying to engineer? We can distinguish two importantly different ways of understanding their project.

On a modest construal, what higher-orderists are trying to engineer are higher-order *analogues* of the first-order notion of existence. On this construal, higher-orderists are making a case that '$\exists X ... X ...$' relates to (first-level) predicates in a fashion closely analogous to that in which '$\exists x ... x ...$' relates to singular terms. Therefore, so the idea goes, we are justified in regarding the former as saying about the worldly relata of (first-level) predicates, i.e. level 1 entities, something closely analogous to what the latter says about the worldly relata of singular terms, i.e. level 0 entities. Since the first-order quantifier '$\exists x ... x ...$' uncontroversially ascribes existence to the worldly relata of terms, the second-order quantifier '$\exists X ... X ...$' should be seen as ascribing something closely analogous, second-order existence, to the worldly relata of (first-level) predicates. On the modest construal, what is being engineered is thus a concept of second-order existence associated with '$\exists X ... X ...$' which is to be distinguished from, yet analogous to, the concept of first-order existence associated with '$\exists x ... x ...$'. More generally, on the modest construal, higher-orderists are aiming at an infinitude of order-specific analogous of first-order existence, one for each order of quantification.

The modest construal of the higher-orderists' engineering proposal just outlined can be contrasted with a more ambitious construal. On the ambitious construal, higher-orderists do not merely aim to engineer an infinity of order-specific concepts of higher-order existence to complement the familiar first-order concept. Rather, they additionally want to engineer a *generalized* or *broadened* concept of existence applying equally to entities drawn from at least some different levels of the higher-orderists' infinite hierarchy. While Trueman is explicit that he is only aiming for order-specific higher-order analogues of existence (2021b, §9.3), at least some passages in Jones 2018 are naturally read as being concerned with the more ambitious project. Thus, Jones suggests that we view the English word 'exists', in its ordinary, pretheoretical usage, as expressing 'the first-order restriction' of a more 'general and fundamental' notion of existence (816). To really be more general than the first-order notion of existence (and for the first-order notion to really be a restriction of it) the notion of existence that Jones is after here would have to apply to everything the first-order notion applies to (i.e. the level 0 entities) and *additionally* to entities of at least some further level. For instance, one way for it to be more general than first-order existence would be to apply to the level 0 entities and additionally to the level 1 entities.

In fact, it sometimes looks as if Jones is concerned with a particularly radical variant of the ambitious project. Thus, he seems to suggest not only that higher-orderists may embrace a notion of existence which applies to entities of different levels of their hierarchy, such as level 0 and level 1 entities, but that they may embrace a notion of existence that applies to each and every entity of any level whatsoever. Thus, he suggests that higher-orderists may countenance a 'fully general notion of existence [which] goes with existential quantification regardless of order' (ibid.). There are, however, well-known problems associated with such an all-encompassing concept of existence in the present context. Informally, if it were possible to devise such an all-encompassing notion of existence, it would seem to equip us with an all-encompassing domain: a domain comprising each and every entity regardless of what level it inhabits. But for familiar Cantorian reasons, the cardinality of the properties definable with respect to a given domain always exceeds the cardinality of the entities in the domain. So there would have to be at least some properties not in the domain after all, contradicting the assumption that it was genuinely all-encompassing. For this reason, the version of the ambitious project that aims at an all-encompassing notion of existence is in acute danger of being *over*-ambitious. We should therefore be hesitant to ascribe to higher-orderists the attempt to construe a concept of existence *that* broad. Rather, when speaking of the ambitious variant of the project, we will focus on the project of devising, in addition to order-specific analogues of first-order existence, a notion of existence broad enough to apply to some (but not necessarily all) entities of different levels. (The availability of such a broadened notion of existence is, in any case, a precondition for the availability of an all-encompassing notion, and we will find already the broadened notion to face substantial obstacles in §3 and §4.)

On the ambitious construal, the higher-orderists' engineering project displays a further striking similarity to some more paradigmatic examples of conceptual engineering. Thus consider Carnapian explications of concepts which are generally regarded as a form of (proto-)engineering (see e.g. Cappelen 2018, 11-12). When Carnap explicates explications, he uses the example of the prescientific concept associated with the term 'fish' which he takes to have been replaced, through a process of explication, by the zoological concept associated with the same term. For better discriminability Carnap calls the former concept 'Fish' and introduces the name 'Piscis' for the latter. When Carnap explains in what way he takes the explicatum to be superior to the explicandum, he points out that:

> A scientific concept is the more fruitful [...] the more it can be used for the formulation of laws. The zoologists found that the animals to which the concept Fish applies, that is, those living in water, have by far not as many other properties in common as the animals which live in water, are cold-blooded vertebrates, and have gills throughout life. Hence the concept Piscis defined by these letter properties allows for more general statements than any concept defined so as to be more similar to Fish, and this is what makes the concept Piscis more fruitful. (Carnap 1950, 6)

While Carnap didn't yet have this piece of philosophical jargon at his disposal, it seems that he takes the explicatum to be preferable over the explicandum because it comes closer to picking out a *natural kind*. This theme is picked up by Clark and Chalmers (1998) whose remarks on the notion of belief are taken to be another prime example of conceptual engineering by Cappelen (2018, 10-11). Clark and Chalmers recommend operating with a concept of belief according to which Otto may believe that P even when Otto's access to the proposition that P is mediated by the assistance of devices 'external' to his mind. They elaborate on this recommendation as follows:

> We do not intend to debate what is standard usage; our broader point is that the notion of belief *ought* to be used so that Otto qualifies as having the belief in question. [...] By using the 'belief' notion in a wider way, it picks out something more akin to a natural kind. The notion becomes deeper and more unified, and is more useful in explanation. (Clark and Chalmers 1998, 14)

Above, we already noted the normative component and the appeal to theoretical fruitfulness as similarities between the higher-orderists' project and more paradigmatic conceptual engineering projects. These points apply both on the modest and on the ambitious construal of the higher-orderists' project. On the ambitious construal, we can discern a further similarity: when Jones is suggesting that higher-orderists use the 'exists' notion in a wider way, he seems to do so for reasons very similar to those cited by Carnap in favour of the 'piscis' notion and by Clark and Chalmers in favour of the wider 'belief' notion: Jones description of the broader notion of existence as more *fundamental* falls in line neatly with Carnap, Clark and Chalmer's descriptions of their respective target concepts as more *natural*, more *unified* and *deeper*.[7]

So far, we have focussed on the higher-orderists' stance vis-a-vis the concept of existence and this concept will continue to be at the centre of our attention in the ensuing sections. But it may be instructive to see that the higher-orderists' engineering enterprise is not confined to this notion, but equally pertains to other logico-metaphysical concepts with regard to which we can similarly distinguish between a modest and an ambitious construal of the engineering project. Thus, note that the identity-predicate '=', familiar from first-order logic, only combines with singular terms (and corresponding variables), and not with predicates (or predicate variables), to form well-formed expressions. But higher-orderists clearly need a way of identifying (and distinguishing) properties when these are conceived of as higher-order entities. In other words: they need a higher-order notion of identity. Following Dorr (2016) in using the sign '≡' for this purpose, the idea is that just like we can use '$a = b$' to state that the singular terms 'a' and 'b' stand for the same portion of reality, so we can use '$F \equiv G$' to state that the (first-level) predicates 'F' and 'G' stand for the same portion of reality. Only that we are concerned with a portion of reality located at level 0 of the higher-orderists' hierarchy in the first case, and a portion of reality located at level 1 in the second.

Similarly to the case of existence, higher-orderists don't usually mean to suggest

[7]Chalmers (2020, 8) remarks on Clark and Chalmers 1998 being described as an instance of conceptual engineering as follows: 'I'm happy to be taken as a paradigm conceptual engineer, but I'm not sure that we saw this as conceptual engineering. Our own view was that these extended cases of beliefs were literally beliefs.' Clark and Chalmers thus took the concept of belief to already cover extended cases of beliefs, so that from their perspective no engineering was even necessary. In the passage quoted in the main text, Clark and Chalmers are addressing those who don't agree that the concept of belief already covers extended cases of belief and try to convince them that it at any rate *ought* to cover such cases. From the perspective of the addressees (albeit not from Clark and Chalmers' own perspective) achieving this will require some engineering of the concept, and Clark and Chalmers' are citing the increased depth, naturalness and unity of a target concept as motivating this engineering project. The point thus remains that the reasons which are given here for an engineering project are similar to those given by the ambitious higher-orderist in citing an increase in fundamentality as a reason to generalize our notion of existence.

that natural language statements involving the phrase 'is identical to' are ever to be formalized as anything other than sentences of the form '$a = b$' (although some think that natural language constructions of the form 'to be F is to be G' express higher-order identity, see Dorr (2016, §1)). Rather, the claim is, that even if we don't use the English phrase 'is identical to' to express what '$\equiv$' expresses, it is still theoretically fruitful to regard '$\equiv$' as expressing a notion of identity. So here, too, it is natural to regard higher-orderists as being engaged in an engineering project. And here, too, we can distinguish between a modest and an ambitious way of construing the project. On the modest construal, higher-orderists are engineering order-specific analogues of first-order identity tailored to the inhabitants of each level of their hierarchy. On the ambitious construal, they are additionally trying to introduce a broadened notion of identity which applies both to level 0 entities and additionally to entities drawn from at least some other level of the hierarchy.

At least sometimes, it seems to be the more ambitious project that higher-orderists are concerned with. Thus, after introducing second-order identity $\equiv$ and building on the Quinean distinction between ontological and ideological commitment and its development in Cowling (2013), Correia and Skiles (2019) suggest that their commitment to the two relations, $=$ and $\equiv$, should not be counted as a twofold ideological commitment (a commitment to two distinct *pieces of ideology*) but rather as a single commitment to one primitive *kind of ideology* (2019, 849). The kind in question would appear to be a broadened notion of identity of which $=$ and $\equiv$ are order-specific restrictions.[8]

As a final example, higher-orderists subject the concepts of property and of proposition to the same treatment as those of existence and of identity. For note that 'is red is a property' is no more grammatical than 'is red exists', and 'snow is white is a proposition' is ill-formed too.[9] But that doesn't stop higher-orderists about properties and propositions from conceiving of themselves as just that: higher-orderists about *properties* and *propositions*.

It might be thought that this case behaves somewhat differently from the two previous ones. For higher-orderists sometimes portray themselves as proposing to *replace* first-order properties/propositions with higher-order ones. Thus Jones (2018) argues that we should not regard any entities at level 0 as properties, only those at level 1 and higher. In contrast, no-one wants to replace first-order existence or identity. But really there is no important difference here. First, not

[8]I have simplified Correia and Skiles's discussion slightly, abstracting from some aspects irrelevant for our purposes.

[9]Not to be confused with the well-formed, though probably false sentence ' "snow is white" is a proposition'. Higher-orderists about propositions, e.g. Williamson (2013), Trueman (2018, 2021a) and Jones (2019), take them to be what whole declarative sentences (which can be conceived as zero-place predicates), such as 'snow is white', stand for.

all higher-orderists are interested in a replacement of properties and propositions. For instance, after pointing out that his higher-order propositions are much more coarse-grained than the traditional first-order ones, Williamson states that:

> There may be both coarse-grained propositions and fine-grained propositions. It is just that the fine-grained ones involve complications unnecessary for the interpretation of higher-order modal logic as a background logic for general metaphysics. (Williamson 2013, 291)

He thus seems open to the idea that higher-order propositions should *supplement*, rather than *replace*, first-order propositions (for a similar stance with respect to properties see Skiba 2020). Second, even those who do aim for a genuine replacement, don't aim for a replacement of *concepts*. Jones (2018) wants us to believe only in higher-order properties, not in first-order ones. But this only means that he wants us to recognize the concept of a first-order property as empty, it doesn't mean he wants us to get rid of that concept. Once more, we can distinguish between a modest and an ambitious variant of this manifestation of the higher-orderists' engineering project. On the modest variant, higher-orderists are aiming at order-specific analogues of the first-order concepts of property and of proposition. On the ambitious variant, it is also broadened notions of property and propositions which are being engineered.[10]

To summarize the main upshot of this section: when confronted with the attitudes higher-orderists display with respect to the concepts of existence, identity, property and proposition, it is very tempting to regard them as being engaged in an exercise of conceptual engineering. On a modest construal of this engineering project, higher-orderists are trying to equip us with higher-order analogues of the familiar first-order notions. On an ambitious construal, higher-orderists are additionally trying to equip us with broadened versions of the relevant concepts which are supposed to apply to entities of distinct levels of their hierarchy.

At this point, one may wonder why one would ever confine oneself to the modest version of the project. Given that a plurality of order-specific notions of existence, identity, property and propositions have successfully been introduced, why *not* comprise them into more general notions of which the input notions can

[10]The list of first-order notions with respect to which higher-orderists can be seen as trying to engineer at least higher-order analogues (if not also broadened notions) doesn't stop there. Further examples include semantic notions such as that of reference and that of a semantic value (see Krämer 2014, Jones 2016, Trueman 2021b, §4,§9). That the higher-orderists' quantificational pluralism leads to engineering projects with respect to a whole range of interrelated concepts is another similarity to more paradigmatic engineering projects. Thus consider Scharp's project of replacing the concept of truth with a pair of concepts (that of *ascending* truth and that of *descending* truth) which equally results in the engineering of a host of interrelated concepts, including e.g. those of validity and knowledge (see Scharp 2013, Ch. 8).

then be seen as order-specific restrictions? Indeed it may even appear necessary to appeal to some generalized notion of, say, existence, to do justice to the idea that first-order existence and second-order existence are really both notions of existence. In §3 and §4, however, I will argue that, from the higher-orderists' own perspective, the ambitious project is deeply problematic. I will therefore conclude, in §5, that higher-orderists are best advised to pursue the modest engineering project and I will briefly discuss the prospects of the modest project when not pursued as part of a more ambitious one.

3 Engineering Broad Existence?

In this section and the next, I will investigate in how far the higher-orderists' ambitious engineering project can succeed. To keep things manageable, I will primarily focus on the case of existence in the following, but most of what will be said applies, *mutatis mutandis*, to the other cases as well. For the sake of definiteness, we may think of higher-orderists as introducing a new predicate, '... EXISTS', intended to express a broadened notion of existence applicable to both level 0 and level 1 entities. The higher-orderists' project is then to endow this predicate with the intended meaning. How might they go about achieving this?

The standard way to formalize, in first-order logic, a natural language claim such as 'Anna exists', is as follows: $\exists x(a = x)$. For a level 0 entity to exist is for there to be some level 0 entity that is first-order identical to it. To ascribe first-order existence to level 0 entities, we will in the following sometimes use the predicate '... exists_1' as an abbreviation for '$\exists x(... = x)$'.

Given a second-order quantifier and a second-order analogue of identity, we can express an analogous second-order claim, ascribing second-order existence to a specific property, R, as follows: $\exists X(R \equiv X)$. For the property of being red, conceived of as a level 1 entity, to exist is for there to be some level 1 entity that is second-order identical to it. To ascribe second-order existence to level 1 entities, we will in the following sometimes use the predicate '... exists_2' as an abbreviation for '$\exists X(... \equiv X)$'.

Since the broadened concept of existence, to be expressed by '... EXISTS', is meant to apply to anything which is either a level 0 entity or a level 1 entity, it is natural to think of it as a disjunction of the more specific notions of existence just discussed. The idea is that to exist in the broadened sense is to be first-order identical to some level 0 entity *or* second-order identical to some level 1 entity. We can put this proposal, somewhat informally, as follows:

(Broad Existence) ... EXISTS $\leftrightarrow$ (... $\text{exists}_1 \vee$ ... exists_2)

An initial worry with respect to (Broad Existence) concerns the claim, which we saw some higher-orderists make, that the target concept of broad existence is not only more general but also more *fundamental* than the order-specific concepts associated with '... exists_1' and '... exists_2'. Since the relevant notion of relative fundamentality of concepts is left implicit when those claims are made, they aren't easy to evaluate. It should be noted, however, that broad existence's claim to fundamentality seems to be in tension with the two most prominent accounts of fundamentality, since these converge on the idea that disjunctions are typically *less* fundamental than their disjuncts. The first of these accounts is a Lewisian account of fundamentality, according to which a property is the more fundamental the more natural the predicate expressing it is (Lewis 1983; see Dorr and Hawthorne 2013 for discussion). According to Lewis's approach, the degree of naturalness of a predicate is measured by its complexity when defined in terms of perfectly natural predicates, rendering disjunctive predicates less natural than their disjuncts. The second is the grounding-based account of fundamentality according to which grounds are more fundamental than what they ground (see e.g. Schaffer 2009). Since disjunctions are typically regarded as grounded in their true disjuncts (see e.g. Fine 2012), this conception equally jars with the idea that claims about broad existence, when understood disjunctively as per (Broad Existence), are more fundamental than their disjuncts.

A more serious problem with the proposal (Broad Existence) is connected to the '...'-notation. While these dots indicate, transparently, that '... exists_1', and '... exists_2' are both predicative expressions, i.e. expressions with an argument place, they also suggest, misleadingly, that we are concerned with the same *type* of argument place twice over. But, really, that's not the case: the two predicates abbreviate, respectively, the expression '$\exists x(... = x)$', whose argument place accepts singular terms and corresponding variables, and '$\exists X(... \equiv X)$', whose argument place accepts (first-level) predicates and corresponding variables. Given that no expression can *simultaneously* function as a singular term(-variable) and as a predicate(-variable), no way of filling these slots with one and the same expression will result in two well-formed disjuncts. In fact, each filling results in at most one well-formed disjunct and at least one ill-formed disjunct. Given that a disjunction is ill-formed as soon as one of its disjuncts is ill-formed, and given that ill-formed expressions are unintelligible, the proposal (Broad Existence) must fail. It's not that the right-hand-side formulates a condition that nothing meets (which would be bad enough, given the meaning it was intended to bestow on '... EXISTS'). Rather, it doesn't even succeed in formulating an intelligible condition. But then (Broad Existence) cannot succeed in making the new predicate '... EXISTS' intelligible.

This problem is not a new one. It is a facet of a problem first noted by Frege —commonly regarded as the first proponent of a higher-order conception of properties— which has become (in)famous as the *concept horse problem*.[11] Frege famously states with respect to his distinction between *objects* (his term for level 0 entities) and *concepts* (his term for properties conceived as level 1 entities) that:

> I do not want to say it is false to say concerning an object what is said here concerning a concept; I want to say it is impossible, senseless to do so. (Frege 1892, 189)

Applied to the case at hand, Frege's point is that what is said by '$\exists X(R \equiv X)$' concerning the property of being red (conceived as a level 1 entity) - namely that there is some level 1 entity which is second-order identical to it - cannot even intelligibly be said concerning a level 0 entity. Any attempt to do so, such as e.g. '$\exists X(a \equiv X)$' is not even false but senseless: '$\exists X(... \equiv X)$' yields a meaningful expression if, but only if, the argument place is filled with a (first-level) predicate (or a corresponding predicate variable). Conversely, what is said by '$\exists x(a = x)$' about the level 0 entity Anna —namely that there is some level 0 entity first-order identical to it— cannot even intelligibly be said concerning a level 1 entity. Any attempt to do so, such as e.g. '$\exists x(R = x)$' is not false but senseless: '$\exists x(... = x)$' yields a meaningful expression if, but only if, the argument place is filled with a singular term (or a corresponding term variable). The attempt to introduce a notion of existence that applies to entities of both level 0 and level 1 via (Broad Existence) thus fails: rather than rendering '*a* EXISTS' and '*R* EXISTS' both true, as intended, it renders these expressions senseless.

A notable upshot of this is that Jones might be too optimistic, when he points out with respect to his higher-order property theory, that 'the concept horse problem [...] does not arise' (2018, 815). He arrives at this conclusion because he takes the concept horse problem to spell trouble primarily for the idea that predicates *refer* to properties in the same way that terms *refer* to objects. Since his higher-order property theory remains neutral with respect to the question of predicate-reference, *this* version of the concept horse problem indeed needn't worry him. But the concept horse problem is famously multi-faceted. Proops (2013) distinguishes between four interconnected versions of the problem, of which the predicate-reference problem is but one (the third version discussed by Proops). The facet of the concept horse problem presently under discussion is closer to the fourth version identified by Proops, which he calls the *inexpressibility of logical category*

[11] See also the discussion in Trueman 2015 and 2021b, §§9.2, 9.3 where the upshot of a Fregean theory of properties for a broadened notions of existence, identity and related concepts is discussed, albeit not in connection to conceptual engineering.

distinctions problem and regards as 'deep and deeply intractable' (2013, 94). Just like we cannot *distinguish* between the two logical categories of level 0 and level 1 entities by saying that each level 0 entity is distinct from each level 1 entity (neither '$\forall x \forall X \neg(x = X)$' nor '$\forall x \forall X \neg(x \equiv X)$' is well formed), so we cannot *comprise* them into a more general category of entities that are either first-order identical to level 0 entities or second-order identical to level 1 entities, which is just what (Broad Existence) attempted to do. So, while Jones may well be right that *one* facet of the concept horse problem doesn't apply to his account, it looks like a *different* facet does apply, at least when his account is taken to involve the ambitious conceptual engineering project identified in §2.

In a paper dedicated specifically to the concept horse problem, Jones (2016, §4.2) makes an interesting suggestion as to how higher-orderists might respond to the facet of the problem presently under consideration and it is natural to wonder whether this suggestion might help in the present context. The suggestion is based on distinguishing between two ways of rejecting a given claim: *rejecting it as false* and *rejecting it as contentless*. The idea is then that higher-orderists can honor the logical category distinction between level 0 and level 1 entities by rejecting any claim as contentless that pretends to assert that something is both a level 0 entity and a level 1 entity. Since the relevant claims are rejected as contentless, rather than as false, this does not commit the higher-orderists to their negations (which they will equally regard as contentless). The problem with this suggestion in the present context is that the distinction drawn among types of rejection seems to have no analogue when it comes to the *positive* counterparts of this attitude: there is only *accepting/endorsing as true* (and hence contentful) and no such thing as *accepting/endorsing as contentless*. But it is hard to see how the higher-orderists' ambitious engineering project of introducing a broad notion of existence could be regarded as successful, if it is granted to be impossible to accept/endorse any claim to the effect that something exists in this broad sense.

4 Two Types of Type Theory

In the last section, we have seen a substantial problem for the higher-orderists' attempt to equip us with a broader concept of existence. The problem results from the assumption that argument places have a fixed type: the gaps in '$\exists x(\ldots = x)$' and '$\exists X(\ldots \equiv X)$' were each taken to admit expressions only of one specific syntactic type (that of singular terms and first-level predicates, respectively). This thwarted the attempt to arrive at a broadened notion of existence by disjoining the more specific ones. In this section, I investigate in how far higher-orderists can reconceive the structure of predication to save the ambitious engineering project.

So far, we have implicitly assumed higher-order logic to take the form of *standard type theory* (STT), the standard framework for higher-order logic which goes back to Russell and Whitehead's *Principa Mathematica*. As we will see, it is this assumption that ratifies our verdicts concerning which expressions are well-formed and which aren't. But there is an alternative: following Degen and Johannsen (2000), a number of higher-orderists, including Linnebo and Rayo (2012), Williamson (2013), Krämer (2017), and Florio and Jones (2021), have shown sympathy to *cumulative type theory* (CTT). And CTT is more permissive about which predications are to count as well-formed in a way conducive to the higher-orderists' engineering project on its ambitious construal. We will now consider this in more detail, bringing the main ideas of STT and CTT to bear on the problem identified in §3, while keeping technicalities at a minimum (we are focussing, for instance, on monadic type theories).[12]

4.1 Broad Existence in Standard Type Theory

According to STT, there is a (countable) infinity of types. Each *symbol* of the language of STT is assigned a unique type, indicated by a numerical superscript: 's^0' is a symbol of the lowest type 0, 's^1' a symbol of the next higher type 1, and so on. The language has constants and variables of any type. STT also takes each *entity* to have a unique type, in the sense that it can be assigned as a value to just one type of variable and can be denoted by just one type of constant. Importantly, STT takes predications, i.e. expressions of the form '$s^m(t^n)$', to be well-formed if and only if the type of the predicate immediately succeeds the type of the subject, i.e. just in case $m = n + 1$. STT has an intra-type identity predicate '=' for each type, definable by a form of Leibniz's law; what is (intra-type) identical is indistinguishable at the next level up:

(Intra-Identity) $x^n = y^n \leftrightarrow_{def.} \forall z^{n+1}(z^{n+1}(x^n) \leftrightarrow z^{n+1}(y^n))$

Importantly, identity claims are thus well-formed in STT if and only if the two symbols flanking '=' are of the same type. Note also that (Intra-Identity) defines a different type-specific identity predicate for each type. STT thus recognizes an infinitude of analogues of first-order identity, one for each level in its infinite hierarchy of types. It thus presupposes that the higher-orderists' modest engineering project succeeds with respect to identity. Since each identity analogue, however,

[12] I will be closely following the specification of STT and CTT in Button and Trueman forthcoming. In particular, the specification of CTT will therefore differ from that in Florio and Jones 2021 in ways that won't ultimately affect any of the arguments. See Button and Trueman forthcoming, §7 for a comparison of these different ways to spell out CTT.

remains type-specific (there is no single identity predicate that can be meaningfully combined with, say, a pair of symbols both of which are of type 1 *and* a pair of symbols both of which are of type 0), STT doesn't yield a broadened identity notion aimed at by the higher-orderists' ambitious engineering project with respect to identity.

The terms and variables we have so far used for level 0 entities, such as 'a' and 'x', are, of course, symbols of the lowest type: 0. They are thus rewritten in STT as 'a^0' and 'x^0'. The terms and variables for the higher-order entities we've been focussing on, such as the first-level predicate constant 'R' and the corresponding variable 'X', are symbols of the immediately succeeding type: 1. Since STT's explicit superscripts make the typographical distinction redundant, they are rewritten as 'r^1' and 'x^1'. Statements of first-order identity, previously rendered as claims of the form '$a = b$', become claims of the form '$a^0 = b^0$'; statements of second-order identity, previously rendered as claims of the form '$R \equiv G$', become claims of the form '$r^1 = g^1$'.

Regarding our background higher-order logic as STT underwrites all the claims made in the previous section regarding the well-formedness or otherwise of formulae. Thus, the main problem we identified for (Broad Existence) was that it rendered e.g. 'a EXISTS' tantamount to the disjunction '$\exists x(a = x) \lor \exists X(a \equiv X)$', which, in virtue of its second disjunct, was deemed unintelligible. Assuming that our background logic takes the form of STT, that is just right. When translated into the official language of STT, the disjunction becomes '$\exists x^0(a^0 = x^0) \lor \exists x^1(a^0 = x^1)$' whose second disjunct is not a well-formed formula of STT.

4.2 Broad Existence in Cumulative Type Theory

Things look different, however, if the background higher-order logic is instead assumed to take the form of CTT. As its name suggests, the guiding idea of CTT is that entities *cumulate* as we rise through the hierarchy of types. While each *symbol* of the language of CTT is still taken to have a unique type, CTT allows *entities* to belong to more than one type: anything that can be denoted by terms and assigned to variables of the lowest type 0, can also be denoted by terms and assigned to variables of any type higher than 0. The entities of the lowest type 0 thus *reoccur* at every higher level of the type-hierarchy. Analogously, anything that can be denoted by terms and assigned to variables of the second lowest type, 1, can also be denoted by terms and assigned to variables of any type higher than 1. While the type-levels of STT are all disjoint from one another, those of CTT expand as we rise upward: on each new level new entities are added, but no entities are lost.

As a result of this conception, CTT relaxes the standards for what counts as a meaningful predication. Like STT, it recognizes combinations of symbols of successive types, such as e.g. '$s^2(t^1)$', as well-formed. But since it takes all the entities of type-level 0 to reoccur at type-level 1, it *also* recognizes e.g. '$s^2(t^0)$' as well-formed: after all, according to CTT, any entity that 't^0' could stand for is also an entity that 't^1' could stand for. So, since '$s^2(t^1)$' is always deemed meaningful and, in particular, deemed meaningful when 't^1' stands for an entity of type 0, '$s^2(t^0)$', whose component 't^0' will equally stand for an entity of type 0, ought to be meaningful too. In general, CTT treats expressions of the form '$s^m(t^n)$' as well-formed not only when $m = n + 1$ but, more generally, when $m > n$.[13] Like STT, CTT contains an intra-type identity predicate '=' for each type, subject to (Intra-Identity). However, unlike in STT, in CTT we can also define a *cross*-type identity predicate, '$\approx$', which combines with symbols of distinct types. Entities are taken to be cross-type identical iff they are indistinguishable at the next level whose type is predicable of both relata.[14] Thus, where k is the type immediately succeeding whichever of the types n and m is the higher one ($k = \max(n, m) + 1$), cross-type identity is defined as follows:

(Cross-Identity) $x^n \approx y^m \leftrightarrow_{def.} \forall z^k(z^k(x^n) \leftrightarrow z^k(y^m))$

Does CTT's cross-type identity amount to the broadened notion of identity aimed at by higher-orderists pursuing the ambitious project? The answer is not entirely straightforward. On the one hand, (Cross-Identity) still yields a different type-specific identity predicate for each different k. On the other hand, for $k \geq 2$, each of these identity predicates is cumulative: for instance, '$a^1 \approx b^1$' and '$a^1 \approx b^0$' are both well-formed and contain the same identity predicate, which thus combines both with a pair of symbols both of which are of type 1 and a pair of symbols one of which is of type 1 and one of which is of type 0.

In any case, CTT's cross-type identity provides us with a new option to implement the idea behind (Broad Existence). Rather than taking an entity to exist in the broad sense if it is *intra*-type identical to a type 0 entity or *intra*-type identical to a type 1 entity, we take it to exist in the broad sense if it is *cross*-type identical to a type 0 entity or *cross*-type identical to a type 1 identity. This way, the main problem with (Broad Existence) is avoided: replacing intra-type identity with cross-type

[13]This feature is responsible for what is taken to be a major selling point of CTT, namely that, unlike STT, it can allow for expressions of infinite types (e.g. expressions of type ω with $\omega > n$ for any natural number n): for a predication of the form '$s^\omega(t^\alpha)$' to be well-formed according to the standards of STT, α would have to immediately precede ω, which is impossible since ω is an infinite type; the requirement that $\omega > \alpha$, in contrast, is met by any finite α. On infinite types and why one might want them, see Linnebo and Rayo 2012.

[14]Linnebo and Rayo (2012, 282), Krämer (2017, 516) and Button and Trueman (forthcoming, §1.2) all use the sign '$\equiv$' for cross-type identity, which we are already using, following Dorr (2016), for the intra-type second-order identity.

identity, 'a EXISTS', for instance, is now rendered as '$\exists x^0(a^0 \approx x^0) \vee \exists x^1(a^0 \approx x^1)$' *both* of whose disjuncts are well-formed formulae of CTT.

In fact, in sentences of the form '$\exists x^0(t^n \approx x^0) \vee \exists x^1(t^n \approx x^1)$' the first disjunct is redundant. Since entities cumulate in CTT, so that each type 0 entity is a type 1 entity, there can't be a type 0 entity cross-type identical to t^n without there also being a type 1 entity cross-type identical to t^n.[15] Accordingly, the disjunction is true if and only if its second disjunct is. So, in CTT we can simply use the *non-disjunctive* '$\exists x^1(t^n \approx x^1)$' to state that t^n exists at level 0 or 1 of the type hierarchy, and more generally, use '$\exists x^m(t^n \approx x^m)$' to state that t^n exists at some level up to level m. This is a welcome observation in light of the *other* problem we encountered with respect to (Broad Existence) in §3 and which arose as a result of the *disjunctive* nature of that original proposal. So the move from STT to CTT in fact helps to avoid *both* of the problems we identified for the higher-orderists attempt to engineer a broadened notion of existence.

4.3 Cumulative Type Theory and Dissolution Arguments for Higher-orderism

The upshot of the discussion so far is this: higher-orderists, who are engaged in an ambitious engineering project as described in §2, may be able to address the problems identified for this project in §3 if, but only if, they are willing and entitled to adopt CTT as their background higher-order logic. This is an interesting result because CTT is rather controversial.

For one thing, there are foundational worries about CTT when conceived of as a background logic for a theory of higher-order properties. Button and Trueman (forthcoming, §4) argue that CTT's type restrictions are, by the theory's own lights, not well-motivated. If they are right, then there are entirely general reasons for any higher-orderist not to base their higher-order property theory on CTT. Evaluating these issues would go far beyond the scope of this paper. But even with these issues set aside, there is a more specific reason why at least certain types of higher-orderists should be weary of solving the problem for the ambitious engineering project by appeal to a CTT background. Thus, recall the dissolution arguments for higher-orderism about properties discussed in §1. The idea was that higher-orderists about properties are entitled to regard e.g. the question whether properties are located as unintelligible, so that there is no need for them to engage in the agonizing search for an answer. The reasoning behind these arguments was this: locational vocabulary, such as the predicate '... is located at the coordinates t, x, y, z', is best

[15] For the formal details underlying this point see Button and Trueman forthcoming, §1.2

construed as combinable only with singular terms, so that higher-orderists, who take predicates, not singular terms, to stand for properties cannot even intelligibly formulate the problematic question. Once higher-orderists adopt CTT, they can no longer run this argument. For once they adopt CTT, the relevant question becomes formulable again. Consider the higher-order property of being red, denoted by the first-level predicate '... is red', which is formalized as 'r^1' in the language of CTT. The predicate '... is located at the coordinates t, x, y, z' is best construed as another first-level predicate ('l^1' in the language of CTT). The problem for the dissolution argument is now that, in CTT, we can ask after the location of the property of being red after all, namely by asking whether it is cross-type identical to something that is located at the coordinates in question: '$\exists x^0(r^1 \approx x^0 \wedge l^1(x^0))$' is well-formed in CTT. So, if higher-orderists accept CTT, they are no longer entitled to dismiss the disputes regarding property location as unintelligible (similar remarks apply to the other arguments from dissolution). Adopting CTT as part of a higher-orderist attempt to engineer a broad notion of existence thus comes at the price of undermining, in the shape of dissolution arguments, an important motivation for adopting higher-orderism in the first place.

How unpalatable this conclusion is will vary depending on the exact motivations of the higher-orderist in question. Higher-orderists (such as Correia and Skiles) who don't place weight on dissolution arguments, needn't be too bothered by it, and the CTT route to broadened notion of existence remains open (barring, of course, the potential foundational concerns we have set aside). Higher-orderists (such as Jones) who place heavy weight on dissolution arguments however, cannot easily accept it.

Can the tension be mitigated by denying CTT's cross-type identity the status of a genuine notion of identity? While most friends and foes of CTT are happy to regard cross-type identity as a bona fide notion of identity (see Degen and Johannsen 2000; Linnebo and Rayo 2012; Krämer 2017; Button and Trueman forthcoming), Jones and Florio (2021, 56, n. 15) voice some concerns over this. In the present context, however, this will be of no help: any reason for doubting that '$\approx$' expresses a genuine notion of identity will translate into to a reason for doubting that the broad existence notion from §4.2, defined with the help of '$\approx$', is a genuine notion of existence. The move will therefore not help higher-orderists who want to simultaneously rely on dissolution arguments as a motivation for higher-orderism *and* provide a broadened existence notion.

5 Conclusion

For higher-orderists who wish to rely on dissolution arguments, the ambitious engineering project seems unattainable: the project requires the availability of CTT as a background logic, but from the perspective of higher-orderists aiming for dissolutions, the very reasons that motivate looking at questions in metaphysics through the lens of higher-order logic in the first place also motivate this lens being cut in the shape of STT, rather than CTT.

This doesn't mean, of course, that the modest engineering project can't still be successful, nor that its success wouldn't be sufficient for the higher-orderists overall agenda. It does point, however, to a crucial point in the modest engineering project: as long as the modest project is pursued as part of the ambitious project, it is not hard for higher-orderists to account for the idea that second-order existence is an analogue of first-order existence: they can point to a background notion of broad existence and regard first-order and second-order existence as order-specific restrictions of it. If the modest project is pursued in isolation, however, there is no longer any broad existence notion forthcoming that could be pointed to in an attempt to unite first-order and second-order existence and to justify their status as analogues.

It is here, I think, that further investigation of the connections between higher-orderism and more paradigmatic engineering projects promises to be be particularly fruitful. What higher-orderists are facing at this point can be seen as a version of the problem of topic (dis)continuity, as it is often referred to in the engineering literature (see Strawson 1963 for an early formulation of this problem in response to Carnapian explications): absent a unifying background notion of broad existence, what justifies the idea that the concepts of first-order and second-order existence pertain to the same topic or subject matter, so that first-order realists and second-order realists about properties can be seen as offering competing realist theories rather than merely talking past each other? Further research on this point has the potential to deepen our understanding both of the higher-orderist position as well as of the nature of conceptual engineering. Thus, it would be interesting to see in how far extant attempts to solve the problem of topic (dis)continuity by conceptual engineers (e.g. in Cappelen 2018, Chs. 9-11, 2020; Prinzing 2018; Thomasson 2020; Nado 2021; see Knoll 2020 for critical discussion) are applicable to the specific version of the problem faced by higher-orderists pursuing the modest project. On the one hand, if some such approaches turn out to be applicable, this may considerably strengthen the higher-orderists' position. Whenever a given approach turns out to be inapplicable, on the other hand, this may be an indication that the proposal in question, while perhaps well suited to the cases with an eye on which it has been originally developed, turns out to be too narrow to account for the full breadth of the problem of topic (dis)continuity in engineering projects. Either way, there are important insights to be gained from a further integration of the debates on higher-orderism and conceptual engineering, debates among which this paper has merely tried to establish some initial contact.

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