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The proverbial strategy free relatives and logical relations

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ABSTRACT

Sentences that ascribe action are logically related, but it is not always obvious why. According to event semantics, implications and non-implications result from referential relations between unpronounced constituents. Taking as starting point examples including free relative clauses, this paper advances the alternative view that examples as such present logical relations as forms of predicative dependence indicated with pronounced constituents. To this end, I argue that Verbal Phrases and verbal traces follow the pattern of Verbal Phrase Anaphora and, more controversially, that they can be semantically interpreted in terms of higher-order quantification that represent actions as properties, but neither as events nor event-kinds.

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Introduction

Sentences that ascribe action are logically related, though at first sight, it is not obvious why. According to the standard account, implications and non-implications depend on patterns of cross-reference between unpronounced events that, in the apt words of one of event semantics' most distinguished practitioners, 'hold the sentence together' (Schein 2017, 23). Cross-reference is a disambiguating function that bound variables perform when they connect initial quantifiers with the argument-places of predicates within their scope (Williams 1981, 158). On the other hand, non-standard explanations remark that once the syntactical structure of action sentences is brought to light pronounced constituents indicate forms of logical dependence in which predicate-exemplification

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plays the starring role. Predicate-exemplification illustrates a second function bound variables execute when they indicate what kind of expression can count as an instance of a quantified formula (Williams 1981, 159). Cross-reference and predicate-exemplification reflect different answers to the question of whether action predicates perform a proper logico-semantic role. Motivated by action ascriptions featuring free relative clauses seldom discussed by advocates of the standard view, this paper offers arguments for a logically non-deflationist theory of action predicates that takes exemplification as a model. Drawing from work on light verbs, I argue that free relative clauses used to ascribe action have a syntactical structure in which Verbal Phrases and verbal traces work together following the Verbal Phrase Anaphora (VP-Anaphora) pattern. This syntactical hypothesis motivates the view that reference to the same predicate through pro-verbs is what really holds sentences together, but the semantic impact of this insight remains unexplored due to some misgivings as to non-nominal quantification. To dispel these doubts and taking a leaf out of Trueman's (2021) identification of quantification in the predicate argument with a form of higher-order quantification of properties, I claim that free relative clauses present us with action as a property and not as a kind of object. To develop some consequences of this view, I criticize an analysis inspired by event semantics in which free relatives refer to event-kinds.

The paper runs as follows. Section 1 introduces free relative clauses in the context of action ascriptions and validity. Section 2 develops a syntactical analysis of free relatives in action ascriptions that is compatible with the view that verbal traces can have the syntax of a referential term but the semantics of a predicate. This promiscuous behaviour, typical of pro-forms, enables pro-verbs and relative pronouns to combine and signal predicative dependence in VP-Anaphor, or so I shall argue. Section 3 exploits this singularity with a semantic purpose. Following Trueman's framework for higher-order quantification, I claim that event terms and action predicates are nowhere intersubstitutable in free relative clauses and predicates refer to actions conceived of as properties. Within this predicative framework, validity results from the fact that predicates refer to their satisfaction conditions. Finally, in Section 4, I consider the reply that free relative clauses refer to event-types and show that it produces wrong predictions under some basic assumptions in event semantics.

1. Free Relative Clauses and Action Ascriptions

Let me introduce, first, some basic terminology to characterize the kind of linguistic forms that will concern us in connection with predicate-exemplification. Consider examples (1)–(3).

(1) I only work with people *who I can trust*.

(2) Yesterday I met my bank manager, *who was in an uncompromising mood*.

(3) *What he did* was amazing. (Radford 2016, 394–397)

In (1) the italicised clause restricts, in this case to persons, the kind of entities referred to in the head, making this an example of a *restrictive relative clause*. The *appositive* clause in (2) comments on the traits of character of someone who has been previously mentioned. In contrast with (1), this qualification does not make part of the main topic of conversation, but it is posed as an aside. Since in (3) there is no overt nominal antecedent, the construction is termed as a *free (i.e. antecedentless) relative clause*.

In this paper, I shall consider certain problems that free relative clauses pose regarding the topic of validity in action ascriptions. In a nutshell, speakers ascribe action by using sentences logically related to other sentences, and sometimes such sentences logically imply others in virtue of how free relative clauses are interpreted. Consider the inference from (4) to (5):

(4) Tom *does whatever* William *does*.

(5) If William *hops*, Tom *hops* (Strawson 1974).

Strawson, who spotted (4) as a potential subject in the context of action ascriptions, forcefully argued that the validity of the argument above is explained on the condition that the free relative is specified with the same predicate in the two places available in the conditional sentence (5). The first obstacle to develop this proposal comes from the linguistic peculiarities of free relative clauses. From the point of view of English syntax, these clauses are challenging in that they do not exhibit nominal antecedents but can, nevertheless, be interpretable in terms of nominal structures and relative pronouns (Radford 2016, 394). In other words, there is a mismatch between the syntactic category of the antecedent and the paraphrases that would help in the interpretation. For example, (4) can be paraphrased as (6).

(6) Tom does *the things that* William does.

Though the antecedent in (4) is certainly verbal, the structure *the things that* (Nominal + Relative) in (6) is linguistically acceptable as paraphrase. A second obstacle comes from semantic considerations on nominal interpretations. On this count (4) is ambiguous, for it admits both the determinate interpretation (6) and the universal interpretation (7).

(7) Tom does *everything that* William does.

For the purposes of giving a proof of validity for the argument (4) to (5), I will endorse Oliver and Smiley's conclusion that, on some reasonable assumptions, the definite and universal readings (6) and (7) are logically equivalent[1] (Oliver and Smiley 2016, 99–100) and leave the discussion of their potential differences in meaning for another occasion. A third obstacle comes from some background assumptions in event semantics, the default approach to validity in action ascriptions. Event semantics has much to say about pronouns and relative clauses. Arguably, the whole movement began with the interpretation of a strange pronoun (Davidson 1967). Consider the argument (8)–(9).

(8) Donald hit Old Joe with a bucket.

(9) Donald *did it* with a bucket.

The pronoun in (9) seems mysterious until one supposes that the verb in (8) introduces an argument for unpronounced events that work as the possible referents of 'it' in this context. Since, according to the hypothesis (8) and (9) refer to the same events, these sentences can be represented with formulae (10) and (11) that make cross-reference explicit, and then the adverb-dropping argument from (8) to (9) is formally proven as valid.

(10) $(\exists e)$[past(e)$\wedge$ hitting(e) $\wedge$ agent(Donald, e) $\wedge$ theme(Old Joe, e) $\wedge$ with(a bucket, e)].

(11) $(\exists e)$[past(e) $\wedge$ agent(Donald, e) $\wedge$ with(a bucket, e)].

Event semantics is a complex and nuanced research programme built around the thesis that reference to events and validity are tightly connected.[2] For the purposes of this paper, I shall only focus on one

[1]But see (Jacobson 1995) and (Oliver and Smiley 2016, chap. 6) and the references there for a discussion of the view that they are not.

[2]For the original view, see the essays in Davidson (2001). For the contemporary standard approach that inspires logical forms (10) and (11), see (Parsons 1990; Landman 2000), and the references there. Pietroski (2005) and Schein (1993, 2017) offer generalizations of event semantics to cover topics not

methodological hallmark of the theory. Adopting events as referents in explanations of validity usually comes with *deflationism* concerning the logical role of action predicates. Consider the platitude, arguably accepted by both deflationists and non-deflationists, that such a role can be characterized by establishing the conditions of satisfaction of the predicates in question. As we shall see, non-deflationists discharge this task by stating disquotational schemata that relate predicates to their satisfaction conditions in terms of a new referential relation called 'predicate reference'. Deflationists will not hear anything of such relation. For them, the conditions of satisfaction of a predicate could not possibly be identified with its referents, for predicates do not and cannot feature in referential relations. Deflationists endorse a theory of truth for a language that relates each sentence to its truth-axioms in which the contribution of predicates amounts to their contribution to the truth-conditions of sentences that contain them. Since truth-axioms do not mention referents for predicates but only the way in which they *map* their arguments (the things they are true *of*) to truth-values, predicates have no proper role over and above mapping.[3] Here is event semantics' mastermind about the logical role of predicates in general:

> The secret [to cope with predication] is attending to the gaps or spaces in predicates, the gaps which come to be occupied by individual constants or the variables of quantification *before predicates can make their contribution to the truth values of sentences*. (Davidson 2005, 159. Emphasis added)

As Davidson has it, apart from the introduction of event variables, action predicates do not have a logico-semantic role to fulfil nor a contribution to the truth value of sentences in which they appear to make. Applied to (8) predicate deflationism dictates that the expression *hit Old Joe* can only make a semantic contribution to (9) after the event arguments, to which the pronoun refers, are satisfied (as (10) shows). Over and above the assignment of these values, i.e. the things the predicate is true of, there is nothing to say, logically speaking, about action predicates.[4]

necessarily connected to action ascription, like concatenation, different kinds of anaphora, and models of clausal structure.

[3] I owe the terminology applied to Davidson's work and the contrast between his and other approaches to predicates to Liebesman (2015). Thanks to an anonymous reader for urging me to clarify my views on deflationism.

[4] For the general, Tarskian-inspired motivation of logical deflationism as to predicates, see Davidson (2005, 159–160). For specific versions of it within event semantics see, for example, Parsons (1990, 107–108), (Flambard 2017), and Schein (1993, 114–115). Bennett (1988, chap. 9), Epstein (2016), and

Given this take on predicates, it is hardly surprising that free relative clauses had been rarely discussed in event semantics.

There is a grain of truth in Strawson's suggestion that the validity of argument (4)–(5) can be reconstructed if one accepts quantification in the predicate position. Only after that one can go on to explain the validity of these arguments as the result of finding predicates such that are applied to William only if they are also applied to Tom. This reconstruction of logical relations is clearly incompatible with predicate deflationism. However, Strawson's proposal, attractive and simple as it may sound, touches upon thorny issues that will concern us in the following sections.[5] Some of them, already mentioned, are general problems about free relative clauses, but others make part of typical philosophical debates that have not attracted much attention in empirical linguistics. An example of the former is the problem of the syntactic category of the antecedent and the paraphrases (6) and (7) above. The mismatch raises some questions about the syntactical structure one should attribute to free relative clauses. This is the topic of Section 2. On the philosophical side, quantification into predicate position brings to the fore questions about whether and how is reference to predicates possible and in what sense this kind of reference is the key to showing that arguments featuring free relative clauses are valid. I shall discuss these issues in Section 3.

2. Verbs and traces

According to a simplified model, the clause structure of sentence (12) roughly corresponds to (13), in which the verb *hit* merges with the Noun Phrase (NP) *Old Joe*[6] to produce the complete Verbal Phrase (VP) *hit Old Joe*.

(12) Donald hit Old Joe.

(13) $[_{NP}$ Donald$]$ $[_{VP}$ $[_{V}$ hit$]$ $[_{NP}$ Old Joe$]]$.

Examples of verbs like *give* in (14) seem to pose a challenge for this type of derivation. Here the verb seems to merge with two complements:

Graves (1993), to name just a few, offer arguments for a predicative, event-free approach to adverb-dropping inferences.

[5]For a discussion of some problems of Strawson's views on non-nominal quantification, see (Grover 1992, chap.6) and (Williams 1981, 185–188).

[6]For readability's sake, in this section, I follow the convention, typical of texts on linguistics, of using italics, not single quotes, to speak about expressions. Nothing in the main argument hangs on it.

Old Joe and *a bucket*. This clashes with the binary derivation of VP's and would force us to postulate different clausal structures for (12), which would increase the complexity of grammatical derivations.

(14) Donald gave Old Joe a bucket.

To avoid uneconomical explanations a more adequate clause structure splits VP's into two kinds of projections: one headed by the lexical verb *gave,* indicated with [$_{VP}$], and the other, indicated with [$_{vP}$], headed by an abstract light verb *V*, as shown in (15). The new vP projection generates (16) as the clausal structure of (12).[7]

(15) [$_{NP}$ Donald] [$_{vP}$ *V* [$_{V}$ gave] [$_{VP}$[$_{NP}$ Old Joe][$_{V}$ ~~gave~~] [$_{NP}$ a bucket]]].[8]

(16) [$_{NP}$ Donald] [$_{vP}$ *V* [$_{VP}$[$_{V}$ hit] [$_{NP}$ Old Joe]]].

The main difference between (13) and (16) is the inclusion of a *V* position up to which verbs can move.[9] If verbs can move, they also can leave traces behind. These traces relate verbal antecedents and verbal inheritors following a distinctive type of anaphora, Verbal Phrase-Anaphora. For example, if the clausal structure (16) leaves a place indicated with *t* in (17), (9) can have the clausal structure indicated in (18).

(17) [$_{NP}$ Donald] [$_{vP}$ *V* + hit [$_{VP}$[$_{V}$ *t*] [$_{NP}$ Old Joe]]].

(18) [$_{NP}$ Donald] [$_{vP}$ *V* + did [$_{VP}$[$_{V}$ it] [$_{AP}$ with a bucket]]].

According to this analysis, *it* indicates the place that the verb *hit* leaves after movement. As the pro-verb *did* indicates, the pronoun replaces a linguistic unit with the morphology of a verb. (18) is thus an example of VP-Anaphora triggered by pro-verbs.

As Colapinto (2020) has forcefully argued, VP-Anaphora is not another example of event anaphora. The whole point of event semantics about anaphora is that pronouns work basically in the same way when used to refer to objects or events. That explains why most of the work on event anaphora has taken the form of a case-by-case

[7]The argument for split projections is framed in terms of Chomsky's minimalist project, see (Chomsky 1995, 321–338). For discussion of minimalism in this connection, see notes 8 and 9 and the references there.

[8]For further discussion on split projections, see (Radford 2009, chap. 8). (Radford 2016) was originally planned as the first of two volumes, that would extend to (Radford 2009). Since the second volume with the new chapter on split projections is not available yet, I quote (Radford 2009) on split projections and the updated (Radford 2016) on free relative clauses.

[9]For a full presentation of the light verb hypothesis, see (Stroik 2001).

reconstruction of well-established results concerning nominal anaphora.[10] One important consequence of this kind of reconstruction is that some nominal features typical of object designations with nominal morphology are transferred to event designation. Consider text (19).

(19) Donald hit Old Joe. He *did it* with a bucket.

The similarity between event and object anaphora justifies the assignment of (10), repeated here, as the logical form of (19).

(10) (∃*e*)[past(*e*)∧ hitting(*e*) ∧ agent(Donald, *e*) ∧ theme(Old Joe, *e*) ∧ with(a bucket, *e*)].

Implicit in this equivalence is the assumption that the pronoun *it* leaves a kind of trace for events that can only be occupied with an expression with some features of nominal morphology, such as *Donald's hitting of Old Joe,* which is a nominal gerund (also called POOS-*ing*$_{of}$ nominal).[11] On the other hand, VP-Anaphora identifies traces that can be occupied by something with verbal morphology, like the bare infinitive *hit Old Joe*. But since NP's exhibit features, like Number, that bare infinitives do not incorporate, traces of events and verbal traces work differently. Consider the following texts (Colapinto 2020, 13, with due change in numbering and # to mark linguistic constructions as unacceptable):

(20) It was sad to watch Serena William's loss at Wimbledon. – There were many. Which one did you see?

(21) It was sad to watch Serena Williams lose at Wimbledon. – # There were many. Which one did you see?

The antecedent *Serena William's loss at Wimbledon* in (20) has nominal morphology (like *Donald's hitting of Old Joe*), while *Serena Williams lose at Wimbledon* in (21) introduces as antecedent *lose at Wimbledon,* an element with verbal morphology. The contrast shows that anaphoric inheritors with countable features are unacceptable when the antecedent is verbal. Also, note that judgements about linguistic acceptability in this

[10]For a complete exposition of this kind of translation of facts about nominal anaphora as facts about event anaphora, see (Schein 1993, 2017). See (Hornstein 1993) and its references for some differences between Davidson and his followers on anaphora.

[11]This terminology comes from Grimm and McNally (2015). For an authoritative approach to nominalization from the point of view of Generative Grammar, see (Chomsky 1970). For contemporary approaches, see (Zucchi 1993) and (Moltmann 2007, 2013). From a philosophical point of view (Vendler 1967, 1968) and (Bennett 1988) provide excellent self-contained introductions to the topic.

analysis respond to the role of pronounced constituents. If the anaphoric head explicitly introduces something with NP features, some inheritors are acceptable. But the same inheritors are unacceptable if the head introduces something with VP features.[12] Conversely, when the head is verbal it is possible to find acceptable examples such as (22) in which pronouns indicate exemplifications of VP's:

(22) It was sad to watch Serena Williams lose at Wimbledon, even though she did it, namely *lose at Wimbledon*, with grace.

These lessons are worth considering in connection with our target example (4), repeated here.

(4) Tom *does whatever* William *does*.

First, notice that following the explanation above, expressions like *the things that* or *everything that* are linguistically acceptable as paraphrases of (4) because speakers can naturally specify them using bare infinitives. Consider specifications of what William does, such as (23) and (24):

(23) Tom *does whatever* William *does*, namely *hop*, *sing,* and *scream*.

(24) If William *hops*, *sings*, and *screams*, Tom *hops*, *sings,* and *screams.*

According to (22), *the things that* William *does* (hop, sing, and scream) are the *same things that* Tom does. Alternatively, Tom *does everything that* William *does*. Therefore, as (24) asserts, if William *hops*, *sings*, and *screams*, Tom *hops*, *sings,* and *screams*. The morpheme *thing* serves here as a nominalizing schema applied to bare infinitives.[13] Verbal traces are peculiar in that they can be occupied by such uninflected forms of verbs as their exemplifications. Second, verbal traces are not full-blooded nominal expressions but only indicate positions open to modification by determiners. Thus, the structure Relative Pronoun + Pro-verb in (4) works like the structure Determiner Phrase + NP. As in other examples of free relative clauses, the relative pronoun serves the purpose of indicating generality, while the pro-verb gives the expression of generality something to be applied to, a verbal trace *t* that can be taken as a nominal expression

[12]To be fair, Colapinto offers a variety of linguistic tests such as coordination, passivization, partitives, and quantification to reject event-based accounts of VP-Anaphora (Colapinto 2020, 13–17). Since the point about differences concerning nominalizations and bare infinitives can be made using only countability, with exception of quantification, I shall not discuss these other contrasts.

[13]This behaviour of the morpheme *thing* is discussed in connection with non-nominal quantifiers in (Moltmann 2013, chap. 3) and the references there. Prior (1971), Williams (1981) and Frápolli (2013) offer the best philosophical introductions to non-nominal quantifiers.

only in the weak grammatical sense of indicating an object that can be so modified.

With verbal traces in the background, a syntactic analysis of the free relative in (4) can proceed like this[14]: First, read (4) as (25).

(25) Tom *does* [*whatever* William *does*]

Then, read the bracketed part of the sentence as a DP that modifies the verbal trace *t* introduced with the light verb of *Tom does*. Finally, identify this trace with the one introduced with the light verb in *William does* that has been raised up to the VP position of the DP. The result is the clausal structure (26).

(26) [$_{NP}$ Tom] [$_{vP}$ *V* + does [$_{VP}$ *t*][$_{DP}$ [$_{D}$ whatever] [$_{CP}$[$_{VP}$ *t*] [$_{CP}$[$_{NP}$ William][$_{vP}$ *V* + does [$_{SV}$]]]]]].

As we saw, (4) conveys the proposition that *everything that* Tom *does* is such that William *does it*. And then (26) can be interpreted as (27) with the help of indices.

(27) [$_{NP}$ Tom][$_{vP}$ *V* + does [$_{VP}$ everything][$_{DP}$ [$_{VP}$ that$_1$] [$_{CP}$[$_{NP}$ William][$_{vP}$ *V* + does [$_{SV}$ *t*$_1$]]]]].

Note that in (27) the verbal trace *t,* and not some sort of cross-reference to unpronounced events, 'holds the sentence together'. The proverbial analysis supports thus the conclusion that *t* occupies a place open to quantification. To find a credible logical representation of [$_{vP}$ *V* does [$_{VP}$ *t*]] using quantifiers it may be helpful to return to (16) and (17).

(16) [$_{NP}$ Donald] [$_{vP}$ *V* [$_{VP}$[$_{V}$ hit] [$_{NP}$ Old Joe]]].

(17) [$_{NP}$ Donald] [$_{vP}$ *V* + hit [$_{VP}$[$_{V}$ *t*] [$_{NP}$ Old Joe]]].

The difference between (16) and (17) is that the verb *hit* is raised to the *V* position, which leaves a trace in the VP position. As Colapinto (2020, 17) suggests, this is a place that a quantificational DP like *something* can occupy. So, an action ascription such as (28) has the clausal structure (29).

(28) Donald did something.

(29) [$_{NP}$ Donald] [$_{vP}$ *V* + did [$_{VP}$ something]].

[14]This analysis is inspired by the discussion of examples of free relatives in (Radford 2016, 464–465), though the examples there do not include verbal phrases nor different kinds of VP-projections.

Suppose one assumes the convention of using *v* (verbal) variables to represent *t* traces with VP morphology. Since the quantificational determiner *something* can move to the initial position as an example of Quantifier Raising (QR)[15], the schematic logical form of (28) should be (30).

(30) (*v*)(Donald did *v*).

Applied to (27) QR moves the quantificational DP *everything* to the initial position. Restoring the verbal quantifier in the initial position, (32) gives the schematic logical form of (4).

(31) If William does t_1, Tom does t_1

(32) (*v*)(William does *v* → Tom does *v*)

Verb variables are formal artefacts that distinguish tense (and aspect) from other verbal features and help us to see what category an expression counts as an example of (4). The *v* signals a place that something with verbal morphology, except for tense, can occupy. With these variables, exemplification amounts to *tensification:* The auxiliar *does* indicates how to tense bare infinitives to obtain examples of action predicates. Replacing *does v* with *hops* is easy to obtain (33), as an instance of (32). (33) says what (5) says. (33) counts as an example of (32) because the verb variable takes a determinate value. Determination comes with tense.

(33) William hops→ Tom hops.

The schematic representations (32) and (33) are not supposed to give a proof of validity of Strawson's example, that is a task for the next section. They are included here to illustrate a point I only sketched in the introduction: Bound variables carry out the task of indicating what can count as an example of a quantified formula independently of the syntactic category of examples. The use of pro-verbs and other non-nominal pro-forms in anaphora partly support the view that speakers can sensibly judge as valid some arguments that deploy different patterns of exemplification. Since non-nominal exemplification seems to defy some accepted views about the syntax of sentences used to ascribe action, I have developed an alternative clausal structure for such sentences in terms of pro-verbs and light verbs to make a reasonable case for the view that action predicates have a far more important role than that assigned to them in event

[15]See (Heim and Kratzer 1998, chap. 7) for the standard approach to QR in linguistics.

semantics.[16] Now, I turn to the philosophical concerns that verb variables can raise and face the challenge of a formal proof of validity.

3. Verb variables and higher-order quantification

According to Section 2, some nominal forms of verbs can be used as specifications of verb variables; some, which incorporate nominal morphology, cannot. This is a linguistic feature, not a metaphysical thesis. Yet many approaches to nominalization take grammatical objects that can be modified and reify them into special or derived objects.[17] In my view, nominalization cannot be taken at face value without introducing serious philosophical problems, so forms of verbs that can specify general action ascriptions do not have to be interpreted as naming entities.

This is not to say that VP-Anaphora has nothing to teach us about action ascriptions. On the contrary, I have claimed that predicates should be interpreted in their own way. Since quantifiers in verb position, such as (30) and (32), are second-order, the general hypothesis to explore here is that second-order quantification is not ontologically committed to entities to which one is not already committed thanks to predication. This is *neutralism*:

Neutralism: Second-order quantification cannot generate an ontological commitment to a kind of entity that is not already generated by the use of predicates (Trueman 2013, 246).

Neutralism fits the linguistic data in the previous section. In examples like (4) to (5), action predicates commit us to an ontology of beings characterized as agents but to no more than that. Though that seems a good point of departure, it also raises some concerns.

Suppose that someone goes on to claim that examples of free relatives like (34) show that, since we can take notice or abhor the actions of others, and provided that the truth-conditional paraphrase (35) is always possible, action ascriptions are ontologically committed to individual events.

(34) Tom was transfixed: whatever William did that day, Tom took notice of it more than anything else, even more than the World Cup.

[16]Thanks to an anonymous referee for helping me to clarify what verbal traces stand for and correct what I now see as a flaw in a previous description of exemplification with verb variables.

[17]The view that different kinds of nominals introduce different kinds of objects (events, facts, states of affairs, universals, etc.) is quite common in both philosophy and linguistics. See the works quoted in note 10 and (Grimm and McNally 2016, 2022) and the references there.

(35) For any particular event *e* and any event *e´* such that $e \neq e'$, Tom took notice of *e* more than *e´*. [18]

To this I want to reply, first, that (35) is a truth-conditional paraphrase of (34) given some assumptions, such as that the verbal phrase 'take notice of' can only take as grammatical objects NP's that purport to refer to individual entities and, consequently, that the pronoun 'it' can only receive objects as values; and, second, that these assumptions are disputable. On the one hand, expressions like 'take notice of' and 'abhor' take a variety of grammatical objects; on the other, they can feature in examples of mixed predication. As to the first point, consider (36) according to which what he never takes notice of is *what his father says*, presumably a set of propositions. To know what kind of grammatical object the verb and the pronoun take in these contexts is to find sentences that express propositions as the right type of examples, as shown with (37). The same goes for predicates, for one can find exemplifications of (34) like (38) in which bare infinitives, but not designations of individual events, can specify the pronoun. By my lights, this linguistic flexibility sounds ontologically *un*-committal.

(36) He never takes notice of what his father says.

(37) Tom was pugnacious: Whatever William said, namely that the Pope was Argentinian, that Labour won the last General Election, and so, Tom took notice of *it* and denied *it*.

(38) Tom was transfixed: whatever William did that day, namely cook, dance, and drink, Tom took notice of it more than anything else, even more than the World Cup.

What might seem strange about (38) is the purported comparison between concrete objects or events and properties. But recall the wide range of things one can take notice of. In a single breath, people can take notice of other people, propositions, theoretical claims, what someone says or thinks, and, of course, of actions as reported with infinitives. If the verbal phrase takes both nominal and non-nominal expressions as grammatical objects, as it happens with (38), the result is an instance of the linguistic phenomenon called mixed-predication. Mixed-predication is an interesting topic, but I hope that the previous discussion shows that it takes some argument[19] to make of it a trustworthy guide to ontological commitment.

[18] I want to thank an anonymous reviewer for bringing this example to my attention.

Trueman's neutralism is not only adequate from the point of view of linguistics but useful from the point of view of logic, for it is easily comparable with other proposals about second-order logic. Neutralism does not involve a rejection of 'the semantic tradition' to adopt, for example, a brand of inferentialism like Wright's (2007). It only requires critical use of the standard semantic apparatus that does not fall prey to some widely extended misunderstandings. It is necessary to avoid, particularly, the equivocation between a displaced sense of 'refer' and its usual sense. In its usual sense, to say that an expression *refers* to an entity amounts to saying that any sentence featuring this expression *says something of* the entity in question. In a displaced sense, for example, when setting a semantic system, both philosophers and linguists tend to say that an expression such as a predicate *refers* to a set (Trueman 2013, 247). In this sense, an action predicate refers to a set of events. In the usual sense, this would entail that any sentence in which an action predicate occurs says something about a set of events. Predicates of sets of events and action predicates are not equivalent in meaning, though. Sets of events can be well-ordered or empty, but this is not something one can say of Serena Williams or Old Joe.

This issue of displaced reference leaves us with a potential problem concerning examples of VP-Anaphora: the validity of Strawson's argument involves some kind of reference-assignment to verbal variables, but we saw that variables do not refer to what they should (i.e. sets of events) according to some understanding of semantics. What else can explain validity if not sets? In another work, Trueman (2021) proposes a battery of arguments that offer a way out of this dilemma. The main thrust of Trueman's book is that terms and predicates are nowhere intersubstitutable.[20] So, terms and predicates refer but never co-refer. Terms refer to objects, while predicates refer to their satisfaction conditions. To keep things clear, I shall assume Trueman's terminology in what follows and speak of two kinds of word-to-world relations: term-reference and predicate-reference. The contrast between (20) and (21), repeated below, in terms of linguistic acceptability is explained by noting that in VP-Anaphora one cannot freely substitute pronouns and pro-verbs that refer to satisfaction conditions with designations that refer to individual events. And examples like (23) are acceptable when interpreted as specifications

[19]And the wrong *kind* of argument about semantic clauses as ontologically revelatory, as I argue below. See (Button and Trueman 2024) for discussion.
[20]See especially (Trueman 2021, chaps. 1–4).

of predicate-reference, but predicates and events are nowhere inter-substitutable as the unacceptable (39) shows.

(20) It was sad to watch Serena William's loss at Wimbledon. – There were many. Which one did you see?

(21) It was sad to watch Serena Williams lose at Wimbledon. – # There were many. Which one did you see?

(23) Tom *does whatever* William *does*, namely *hop*, *sing,* and *scream*.

(39) # Tom *does whatever* William *does*, namely *William's hopping*, *William's singing,* and *William's screaming*.

If one follows Trueman's basic idea, the contrast between (22) and (39) can be put in terms of how reference is specified by means of different disquotational schemata. A nominal gerund can be inserted in the place of *a* in (40) to specify event-reference. Take, for example, *William's hopping;* then you get (41) as result.

(40) '*a*' term-refers to *a*.

(41) 'William's hopping' term-refers to William's hopping.

A principle like (40) does not make sense applied to predicates, for predicate-reference connects expressions of different types: on the one hand, a term that designates a predicate; on the other hand, a predicate that is represented with a second-order variable Y.[21] With this difference in mind and using x to mark the place of a predicate we obtain the disquotational schema (42).

(42) (*y*)(*y* satisfies x ↔ Y*y*) (Trueman 2021, 71).

(43) is an example of (42) applied to *hop*.

(43) (*y*)(*y* satisfies '*x* hops' ↔ *x* hops).

To say that an expression x predicate-refers to a property in this framework is to say what the expression one substitutes x for, i.e. a predicate, would have as satisfaction condition. So, the predicate '*x* hops' refers to the property of hopping if and only if any object satisfies the predicate and if and only if such object hops, as (42) asserts.[22] But reference to properties is never reference to objects (or events), so event terms and action

[21] See (Trueman 2021, 51) for an overview of this problem.
[22] Accordingly, if nothing hops, the predicate refers to an empty property. Thanks to an anonymous reviewer for this remark.

predicates are nowhere intersubstitutable. To put the distinction in terms of Section 2, one can note that predicate reference can incorporate non-nominal aspects of meaning that verb variables and traces highlight. For example, suppose that (44) is true. Then, following (43), (45) cannot be false.

(44) William satisfies '*x* hops'.

(45) William hops.

Thanks to these equivalences, the schematic (31) can be replaced with the second-order formula (46).

(32) (∀*v*)(William does *v* → Tom does *v*).

(46) (∀Y)(Y William→ Y Tom).

(46) does say something about William and Tom only indirectly: it says that if something said of William is true of him, this thing cannot be false of Tom whenever said of him. Alternatively, (46) says something true about how things said of William are connected to things said of Tom: if anything is said of William truly, it is also said of Tom truly.[23] Thus, to understand (46), we are not forced to say things neither of sets nor classes.[24]

The proof of validity using the semantics for second-order quantifiers that Trueman adopts is straightforward, but since the discussion of this system may clarify some residual peculiarities of free relatives, I am going to reproduce only the clauses for the second-order universal quantifier.

Let *L* be a formal second-order language. An interpretation $< D, v >$ is an ordered pair such that *D* is a domain of objects and *v* is a valuation function that maps individual constants of *L* to members of *D* and *n*-adic predicates of *L* to sets of ordered *n*-tuples of *D*.

Let *I* be any interpretation, Φ, Ψ, and Ξ any well-formed-formulas of *L*, and *B* be any *n*-adic predicate of *L* that does not appear in Φ.

[23]See (Trueman 2021, 30) for a discussion of this difference between what first-order and second-order predicates say.

[24]For a discussion of semantics of higher-order quantifiers in terms of valuations as higher-order objects and not sets, see (Button and Walsh 2018, chap. 12), particularly § 12.A.

(∀) If Φ = ∀*A* then Φ is true on *I* iff $\Psi\ [\frac{A}{B}]$ is true on every *B*-variant of *I*, where a *B*-variant of *I* is an interpretation that differs from *I* at most in assigning a different set of ordered n-tuple to *B*.[25]

According to (∀), (46) is true on *I* if and only if $\Psi\ [\frac{Y}{B}]$ is true in every *B* – variant of *I*, in particular in one that assigns *B* the ordered tuples in which the first member satisfies '*x* hops'. In this variant, if (46) is true, (47), which by the equivalence (44)-(45) says what (5) says, is also true. So, Strawson's argument is proven as formally valid.

(47) William satisfies '*x* hops'→ Tom satisfies '*x* hops'.

As Trueman correctly remarks (Trueman 2013, 248), this interpretation of predicate variables is not substitutional. Even if there were no *n*-tuples that verify *A* on *I*, every *B*-variant of *I* could, in principle, verify $\Psi[\frac{A}{B}]$. This distinction is crucial for it makes room for arguments in which (4) entails conclusions like (48) in which no explicit action predicate is mentioned, but satisfaction conditions for 'William does this' and 'Tom does this' can be recovered contextually.

(48) If William does this, Tom does this.[26]

Trueman's neutralist interpretation of second-order quantifiers raises some interesting questions that I will not pursue here, like, for example, what factors that usually affect term-reference (such as indexicality) can also affect predicate-reference. All I want to highlight is that, given the definition of *B*-variants, properties that do not correspond to a predicate in *I* can be, nevertheless, referred to.

Summing up, in Section 1, I argued that free relatives show that action sentences have a place for verbs and that this place allows a kind of logical connection in which predicates have a starring role in action ascriptions. In this section, I have shown that this logical role can be accepted without any kind of ontological risks as ingredients in a proof of validity of the argument (4) to (5).[27] So, the validity of some everyday inferences about action ascriptions requires careful consideration of purely verbal aspects of meaning that can only be taken seriously after some adjustments of the way in which concepts like *reference* are used,

[25]See (Trueman 2013, 2021). For the original presentation of the system, see (Mates 1972, chap. 4).
[26]With his characteristic wit, Strawson takes examples like (49) to show that 'William's behaviour might be indescribable without therefore being inimitable' (Strawson 1974, 66).
[27]The methodological importance of everyday inferences to deal with non-nominal quantifiers is also stressed in (Prior 1971), (Moltmann 2013), and is an important motivation behind Trueman's prenective view on content. See, for example (Trueman 2021, § 12.3)

perhaps *mis*used, when doing formal semantics. Action predicates refer to properties, but *pace* many standard views, properties are not a new kind of object. In the final section, I will discuss the reply, inspired by event semantics, that free relative clauses refer to types of events and not to properties and show that, given some background assumptions in this semantic tradition, it does not fare better than the proverbial strategy.

4. Reference to event types to the rescue?

Up to this point, an advocate of event semantics should certainly be eager to offer a reply. She may naturally point out that the logical structure of Strawson's argument leads directly to the hypothesis that verbal gerunds refer to event-*types*.[28] Put in the terms of recent developments on nominalization and reference to events the proposal runs as follows (Grimm and McNally 2016). Examples in the GloWbE corpus (Davies 2013) attest to the existence of examples of verbal gerunds that can bear a determiner. But since according to the received opinion verbal gerunds do not share nominal features like this that involve a sense of singularity as to the referent, the existence of examples like (49) requires some explanation.

(49) The knowing of the answer.

According to Grimm and McNally the DP + POOS-*ing* gerunds structure indicates a strong connection between nominals and NPs: some examples with NPs can be only explained if one accepts that there is a kind-describing nominal layer within DPs basically for the same reasons that the existence of (49) makes room for the view that there is an event-type layer within VPs. So, one can refer to kinds to explain some otherwise intriguing examples of nominal modification in the same way one can refer to event-types to explain some otherwise deviant examples of modification of verbal gerunds. Constructions like (40) are scarce and often judged as unacceptable if considered out-of-the blue for they can only make sense constrained by a previous discourse. In particular, the possibility of bearing a determiner is constrained by reference in the previous discourse to an event-type non-obligatorily PRO-controlled as the schematic clausal structure (50) shows.

(50) $[_{DP}\ [_{D'}$ the $[_{vP}$ [PRO] . . . $[_{VP}$ VP]]]].

[28]Interestingly, Strawson opens his paper on free relatives by considering and rejecting a paraphrase of (4) in terms of reference to action-kinds, a proxy for event-types. See (Strawson 1974, 64–65).

Remarkably, Grimm and McNally observe that 'This very simple syntactic analysis accounts for the fact that *the* + VP*ing* has the internal syntax of a VP and the external syntax of a nominal – specifically, a DP – in the obvious way' (Grimm and McNally 2016, 171).

There are striking similarities between (51) and the syntactic analysis proposed in Section 2. However, the additional idea that there is an event-type layer within VPs to explain free relatives is obviously problematic for a predicative analysis. To be fair, free relatives are not Grimm and McNally's topic, and the application of their analysis of verbal gerunds in terms of event-kinds has been raised by audiences with whom I have discussed previous versions of this paper. The main reason to be suspicious about applying reference to event-types to examples like (4) follows directly from the way in which event semantics would presumably identify the event-type layer within VPs. Since pronouns signal events as unpronounced constituents of action sentences, the strategy of identifying events in silence comes hand in hand with the view that when reference to events is not explicit, as it happens with (4), one must suppose that some linguistic material in the anaphoric head has been elided from the inheritor. Adverb-dropping inferences, for example, are classified as examples in which conjunctions that describe logically related events are reduced.[29] Given such assumptions, it is difficult to see how to deal with free relatives within this framework if not as the result of Wh-Cleft sentences that identify event-type layers as constituents in VPs. For example, (4) would be interpreted as (51) and (5) as (52).

(51) What William and Tom do is ___.

(52) What William and Tom do is hop.

According to this constituency test, what William and Tom *do* is what a pronoun like 'that' is used to refer to, presumably an event-type including 'all the arguments that jointly or severally performed the relevant actions' (Schein 1993, 259). However, this kind of analysis driven by VP-Ellipsis is coarse-grained when applied to logical relations, while analyses driven by VP-Anaphora are fine-grained. The latter ground logical relations in a

[29]Conjunction reduction is key in Schein's extensive reconstruction of results on nominal anaphora in the context of event anaphora. See (Schein 1993, chap. 6) and (Schein 2017, chaps. 2 and 3). For a discussion on the connection between ellipsis and semantic structure, see Heim and Kratzer's *Logical Form Condition on Ellipsis* (Heim and Kratzer 1998, 250) and the references there. For an unjustly neglected set of strong arguments against the acceptance of conjunction reduction in general, including its role in the account of logical relations, see (Wierzbicka 1980, chap. 7) and the references there.

peculiar way that is invisible if one assumes an analysis in which 'do' is an auxiliary verb that signals event-types as in (51). Let us suppose, for the sake of argument, that reference to event-types and reference to kinds share central characteristics in anaphora. In this connection, Carlson noted that the latter has a peculiar behaviour known as 'the illusory token reference' (Grimm and McNally 2016, 170). Consider example (53):

(53) Mary hates *raccoons* because *they* stole her sweet corn (Carlson 1980, 25).[30]

Here the NP 'racoons' refers to a *kind* but given the episodic context of interpretation triggered with the predicate 'stole her sweet corn' we are under the impression that the pronoun 'they' anaphorically refers to the raccoons that stole Mary's corn. This token reference is illusory since, by hypothesis, sentence (53) refers to kinds. If free relatives in action ascriptions referred to event-types we should expect to fall prey to this illusion. Now consider (4) and its exemplification (54).

(4) Tom *does whatever* William *does*.

(54) If William greets a policeman on the road, Tom greets a policeman on the road.

If 'does whatever' referred to event-types, (54) would be subjected to the illusory token reference according to which 'greets a policeman on the road' refers to the same events in both (54)'s protasis and apodosis. Hence, the illusory token reference would make the predicate collective, meaning that William and Tom participate in greeting the same policeman on the road. By contrast, in my interpretation, in terms of verbal traces and higher-order quantification, ambiguity does not come from the mismatch between the peculiarities of a given semantic analysis and speakers' judgments but from natural language itself. Collective and distributive predicates have different conditions of satisfaction that verbal traces keep track of.[31] If the predicate exemplified is collective,

[30]A sceptical reader about the argument from the illusory token reference might consider (54) as a mistake and be tempted to replace it with 'Mary hates *raccoons* because *some of them* stole her sweet corn'. To accept this correction is to make the argument below pointless. Unfortunately, things are not so simple, since such correction only work on the condition that bare plurals like 'racoons' have only an existential reading in anaphora, while it is widely accepted that they also have a generic interpretation, as in 'Bill trapped *eagles* last night even though he knows full well that *they* are on the verge of extinction' (Carlson 1980, 25). It is precisely the ambiguity between these interpretations and the necessity to explain their connection in anaphora what led Carlson (1980, 24–31) to argue for a unified interpretation in which bare plurals refer to kinds of things. Thanks to an anonymous referee for raising this concern.

[31]Though this uncompromising view seems to be the default approach in plural logic among logicians (see (Oliver and Smiley 2016) and (McKay 2006)), in the context of event semantics Schein (1993) defends a reduction of the singular to the collective to explain logical relations.

the default interpretation is collective; if the predicate is distributive, the default interpretation is distributive; if it is unclear what kind of predicate is exemplified, the exemplification will be ambiguous.[32] The predicative approach does not introduce illusory token reference because it does not postulate any reference to events in the first place.

More importantly, the problem of 'inverse scope readings' (Cechetto and Percus 2006, 79) that emerge in interpretations driven by VP-Ellipsis, which presumably indicate reference to event-kinds, does not affect a proposal driven by VP-Anaphora as the one defended here. Consider Cechetto and Percus' examples (55) and (56). Inverse scope makes (55) logically compatible with (56), according to which different technicians inspected the planes. This is not true of an interpretation in terms of VP-Anaphora like (57) from which one infers that a determinate technician inspected every plane.

(55) A security agent inspected every plane, and a technician did *too*.

(56) A security agent inspected every plane, and a technician did *that* too.

(57) A security agent inspected every plane, and a technician inspected every plane *too*.

(59) A security agent inspected every plane, and a technician did *it* too.

These contrasts in how event-types and action predicates are instantiated show that an analysis of free relatives in which relative pronouns and pro-verbs work together to indicate predicative connections in VP-Anaphora is in a better position to explain logical relations.

A predicative or proverbial approach to action ascriptions presents us with actions as properties and not as referents. This is, by itself, an interesting result in a field that has been clearly dominated by event semantics. I do not want to muddy the waters here, but the proverbial approach makes one wonder about the connection between Strawson's and Davidson's examples. If action is expressed as a property in free relative clauses, it may sound a little dubious that it should appear as an event in adverb-dropping inferences. Pursuing this idea would require a thorough comparison of events and verbal traces in terms of logical potential. Radford's systematic discussion of vP projections (Radford 2009, §§ 8.6–8.7) is a first step in this direction. He has shown that

[32] And, of course, there are verbal features like Aspect that turn the distributive into the collective. Consider the free relative 'Tom is doing whatever William is doing'. This example sounds as if William and Tom, in a specific context, are doing everything together. Aspect is a difficult topic for another occasion.

verbal traces are flexible enough to explain features such as the logical impact of order in the interpretation of nested adverbial modifiers or the distinction between resultative and non-resultative predicates; topics that have partly motivated some works on event semantics such as (Landman 2000) and (Parsons 1990). Though this frankly sounds like promising news, more work must be done to offer a predicative analysis of Davidson's examples. Further, if actions can be seriously taken as properties, the proverbial strategy should have an impact on how we understand ascriptions of intention. Matters tend to be more complicated on this subject. Still, it would be interesting to explore what verbal traces have to offer in connection to well-known philosophical problems related to the content of intention. In sum, it would be nice to look at both action and intention in terms of higher-order metaphysics. Wherever these thoughts may lead, this is not the occasion to pursue them.

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