Adjectival passives and adjectival participles in English

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Is it oxymoronic to speak of 'adjectival passives' in English? A construction like *They seem very underrated by everyone* resembles a canonical passive in some respects, for instance in the optional expression of an external argument in a *by*-phrase. However, such structures differ from canonical passives in various ways. They show adjectival properties like *very*-modification. Canonical passives often require particular auxiliaries (*be* in English), but adjectival participles have no such requirement (*underrated people*). Adjectival participles differ from normal passives in the interpretation (and existence) of implicit arguments in that *by*-phrases are illicit with some adjectival participles (*the car seemed very damaged* (**by John*)) and in that a structure like *very overdressed people* allows a coreferent (i.e. reflexive) interpretation, unlike a verbal passive like *they are being dressed*. Such facts are often taken to show that verbal but not adjectival participles have implicit external arguments. Finally, unaccusative-based participles like *wilted flowers* are in no useful sense passive. Such facts have inspired analyses which do not recognize a notion of *adjectival passive*. This study will show that this is incorrect, suggesting that theories of non-canonical passivisation can benefit from an understanding of the grammar of adjectival participles.

We proceed as follows. Section 1 discusses tests for adjectival participles and distinguishes three semantic classes of them, including a previously unnoted class which expresses an in-progress situation. Section 2 argues that Themes in adjectival participles are initially merged as external arguments, unlike Themes in standard passives. Section 3 challenges the standard claim that adjectival passives lack implicit Agents. I show that not all adjectival participles exhibit the coreferent interpretation seen in *overdressed people*, which I interpret as showing that they have implicit Agents. Constraints on *by*-phrases and purpose clauses are shown not to undermine this conclusion. Section 4 is a detailed discussion of adjectival participles based on unaccusatives. Constraints on such participles are argued to show that there must be passive-like rules which only tolerate transitive verbs as input. Section 5 proposes a syntactic and semantic analysis for the various types of adjectival participles.

Some caveats: This study is a progress report, which I present, despite several unanswered questions and provisional analytic choices, because it unearths several previously undiscussed empirical phenomena and theoretical problems. If at some points I seem overzealous in arguing against elegant, unified, stipulation-free accounts, this is not due to fealty to some antiscientific anything-goes framework, but to doubts that the range of (familiar and new) data treated here allow elegant analyses. I hope nonetheless that that this essay will inspire attempts at more principled accounts with the same empirical coverage.

1 Distinguishing features of adjectival participles

This section distinguishes adjectival participles from other participles and discusses their basic semantic properties, presenting both well-known and new observations.

Standard tests for the adjectival status of participles are given in (1):

(1) a. Adjectival degree modifiers: *It is very {neglected/damaged/overrated}.*
  b. Adjectival *un*-prefixation[1]: *unopened presents; unattended-to matters*
  c. Selection by AP-selecting verbs: *It {seemed/remained/became} very damaged.*
  d. Coordination with other A(P)s: *They are {dressed and ready/dead and buried}.*
  e. Incompatibility with double objects: **It remained given scant attention.*

DP-internal use of participles is not included in (1) since some DP-internal participles behave more like verbal participles than adjectival participles (cf. Sleeman 2011, Meltzer 2011, note

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[1] Cases like *unwrapped presents* could involve either verbal *un-* ('presents which got unwrapped') or adjectival *un-* ('presents which have not been wrapped'). The (here irrelevant) verbal reading asserts an event which caused the Theme not to be in a wrapped state, while the adjectival reading entails that no event occurred.

1). This is especially clear for postnominal participles, witness e.g. the tolerance in (2)a) of double objects, despite (1)e). That such participles are only used DP-internally suggests an analysis involving reduced relativisation of a verbal passive (see Sleeman for recent discussion), although (2)b,c) should make us wary of appeal to DP-specific mechanisms to explain predicative-attributive contrasts like (1)e) vs. (2)a). Note also that preference for DP-internal use also affects prenominal participles (*failed authors* vs. **this author is failed*; likewise for (2)d)). More work is needed to understand this phenomenon and assess its relevance to the verbal-adjectival distinction.

(2) a. One theory not given much attention by many was Multistratal Nanolexicalism.
  b. With [John given a warning by the boss] he had to work more carefully.
  c. She saw [him given mouth-to-mouth resuscitation] by the lifeguard.
  d. fallen/vanished soldiers, recently appeared/arrived books; sunken ships, murdered diplomats, downgraded ratings, recently spread viruses

I distinguish three different semantic classes of adjectival participles. **Resultative participles** express states resulting from events named by the related verbs (e.g. Embick 2004, Haspelmath 1994). Thus, the adjectival interpretation of (3)a) asserts that the car is in a state resulting from an event of scratching/selling.

(3) a. The car is {scratched/sold}.
  b. The bars are <u>bent</u> because the craftsman moulded them that way.
  c. After the landmine accident he was lucky that his legs were still <u>attached</u>.

Unlike resultative participles, the participles in (3)b,c) do not entail prior events despite their being related to eventive verbs. These are often called *stative* participles (cf. e.g. Dubinsky & Simago 1996; Embick 2004), but to forestall confusion with another type of purely stative participle seen shortly I call them **e-statives** (short for *eventive-verb-related pure statives*).

 (4) and (5) illustrate a class of adjectival participles not usually distinguished, which I call **situation-in-progress participles**. Here the participle's time reference matches that of the situation described by the corresponding verb. The (rare) participles in (4) express in-progress events. (4)a,b) cannot be uttered if the music is over or the car is stationary (ignoring a resultative reading in (4)b) where bad driving has affected the car). In (4)c,d) the pictures depict in-progress events and need not reveal anything about the states of the Theme arguments. The participles in (5) relate to stative verb uses. An analysis of these as resultative participles based on eventive verb uses fails in (5)a-c). They differ from e-statives for instance in being related to stative verb uses and in allowing *by*-phrases.

(4) a. The flute seems well played, from what I can hear amidst the surface noise.
  b. That blue car seems badly driven, so keep away from it.
  c. The mediaeval painting shows tortured people in the background.
  d. The photograph shows doctors and operated-on people.

(5) a. That we remain held down by gravity has its benefits.
  b. The share remained undervalued by investors from the time of its issue.
  c. Wupwup free relatives remained neglected until they were first studied in 1979.
  e. feared/depressed people; inhabited planets, sponsored/much-needed projects

The participles in (4)c,d) are not necessarily adjectival. The coordination test gives unimpressive results (*[??]sick and operated-on patients*) and other tests in (1) are inapplicable or unrevealing (*un-operated on patients* can always be analysed as resultative). Like (2)a), (4)c,d) lack predicative counterparts (*She is operated on* is a verbal passive interpreted iteratively). (4)c,d) is thus another illustration of the unclear status of prenominal participles. Nevertheless, these objections do not apply to (4)a,b).

2   Themes of adjectival participles merge outside participle morphology

This section argues against what I call the **Theme-in-PrtP Analysis**, i.e. the claim that Themes (a term I use as shorthand for 'arguments corresponding to V's internal DP argument') are initially merged in (verbal projections inside) projections of adjectival participles. I argue that the underlined trace in (6)a is not motivated, unlike the trace in the verbal passive in (6)b. In this I agree with several lexicalist studies (e.g. Levin & Rappaport 1986, Meltzer 2011). I follow such work in speaking of **externalization** of Themes in adjectival participles, though is not meant to imply that participles are formed lexically or that the external status of the Theme is due to a (lexical or syntactic) *operation*.

(6)   a. *I consider* [$_{SC}$ *the book* [$_{AP}$ *very overrat-ed* [$_{VP}$ t$_{overrate}$ t$_{the.book}$]]].
   b. *The book was being overrated* t$_{the.book}$ *by most critics back then.*

Here I only discuss English data, but note that arguments exist for Theme externalisation in adjectival participles in other languages, based mainly on failed unaccusativity tests like Russian genitive of negation, Hebrew possessor datives and postverbal subjects, and Italian *ne*-cliticisation (Borer 2005:61ff, Meltzer 2011: sect 5.3, Cinque 1990:36f).

2.1   Coordination and ATB

My first argument is an adaption to participles of an argument in Meltzer (2012) against the Theme-in-AP analysis of non-participial adjectives. The argument exploits two observations about (7)a,b. Firstly, *likely* is thematically a raising adjective, hence the trace after it (the existence of which is supported by the floating quantifier *all*). Secondly, *very* in (7)a,b can have scope over the participles but not over *likely*. (7)c gives the syntax for the illicit reading in which *very* includes *likely* in its scope.

(7)   a. They are very depressed and likely all t$_{they}$ to leave.
   b. They are very overrated and likely all t$_{they}$ to perform badly.
   c. *They are t$_{they}$ [$_{AP}$ very [$_{AP}$ [$_{AP}$ depressed] and [$_{AP}$ likely all t$_{they}$ to leave]]].
   d. *They are t$_{they}$ [$_{AP}$ very [$_{AP}$[$_{AP}$ depressed t$_{they}$] and [$_{AP}$ likely all t$_{they}$ to leave]]].
   e. They are very [$_{AP}$ depressed and full of resentment].
   f. They are [$_{SC}$ t$_{they}$ [$_{AP}$ very depressed] and [$_{SC}$ t$_{they}$ [$_{AP}$ likely all t$_{they}$ to leave]]].

If adjectival participle projections do not contain traces of Theme arguments, then we can explain the unacceptability of (7)c simply. *They* moves out of one conjunct but not the other, violating the Coordinate Structure Constraint. If we posit the underlined trace in (7)d, then the CSC argument is unusable and the structure's unacceptability has no clear source. (7)e shows that there is no problem with wide-scope *very* if the second conjunct contains a non-raising adjective. To complete the argument, note that the acceptable interpretation involves either coordination of small clauses (or comparable constituents) as in (7)f, or coordination of larger constituents with SC-external material undergoing coordination reduction.

2.2   Prenominal participles

I now show that the Theme-in-PrtP analysis causes problems in the analysis of prenominal participles. If we assume that prenominal participles are either adjuncts to (extended) N-projections or specifiers of functional heads dominating N, then the most obvious way of implementing the Theme-in-PrtP analysis is as in (8). Here the participle projection has a silent Theme, labeled X. An evaluation of the merits of candidates for X depends partly on their ability to capture the generalisation in (9), which I will briefly pause to discuss.

(8)   [$_{DP}$ *an* [$_{FP/NP}$ [$_{PrtP}$ *overpaid* [$_{VP}$ t$_{overpay}$ X$_i$]] [$_{F'/FP/NP}$ (…) *boss$_i$*]]]]

(9)   INTERNAL ARGUMENT OBSERVATION: Adjectival participles predicate over nominals corresponding to internal structural arguments associated with their related verbs.

(9) allows resultative adjectival participles to predicate over Themes of transitives and unaccusatives, over structural arguments associated with prepositional verbs (*trampled-on*

roses; that the argument is structural is seen in *the roses were trampled on*) and over ECM arguments (*He seemed believed to be a liar*; see Bruening 2012). (9) excludes an Agent interpretation for the predicated-over N/DP: (8) cannot be a boss who overpays people[2]. (9) also excludes non-argument or added argument interpretations: *stolen/baked people* can be construed as direct objects of *steal/bake*, but not as victims/beneficiaries of theft/baking (a non-trivial point given e.g. that imaginable *–ee*-affixations like *stealee*, *bakee* admit of such interpretations).

To capture (9), analyses like (8) must assume that the predicated-over N is coindexed with X. Such analyses must exclude imaginable instances of X not fulfilling this requirement, including (i) arbitrary PRO or an empty indefinite pronoun (which would wrongly predict *frightened prospects* to mean 'prospects that frighten people') or (ii) an incorporated Theme (which would wrongly predict (10); the acceptable possessor raising structures in (10)c are unproductive, see Marchand (1969:93f)).

(10) a. **It/There seemed car-damaged.*   [intended meaning: 'cars seemed to be damaged']
    b. **plaster-crumbled facades; *research-criticised professor; *engine-repaired cars; *water-emptied buckets; *beer-drunk bottles*
    c. *heartbroken people* (but **glass-broken door*); *crestfallen people* (**leaf-fallen tree*)

What kind of item could X be? If X is a trace (silent copy) of *boss* in (8), then (9) is captured, but one would need to defend an unprecedented derivation where *boss* has moved downwards out of an adjunct/specifier in its own (extended) projection. If X is PRO, then (9) might be captured by assuming that D both controls PRO and binds the referential argument of the modified N. But this cannot be right since (9) holds even for phrasal compounds like (11)a, where the modified N *manuscript* does not have its own determiner, cf. (11)b.

(11) a. this [$_{FP/NP}$ rejected manuscript] dispute
    b. *this [$_{DP}$ a rejected manuscript] dispute

A more promising variant of the Theme-in-PrtP analysis is Bruening (2012: sect. 5.2), who gives resultative participles the structure in (12). The Theme inside the participle phrase is the trace of an empty operator (OP), a lambda abstractor. OP is attracted to the edge of AP, ensuring that AP has an open argument position, which the modified N fills. OP cannot be inserted as an Agent in spec,Voice, as A selects an unsaturated Voice projection and existentially binds the Agent. These ideas jointly ensure that (9) is upheld. However, there is no obvious way to derive the requirement that A must attract OP. Without such an explanation, data like (10)a,b are only excluded by stipulation.

(12)   [$_{NP}$ [$_{AP}$ OP [$_A$ *-en* [$_{Voice}$ Voice [$_{vP}$ *v* [$_{RootP}$ *prove* t$_{OP}$]]]]] *fact*]

Perhaps because of problems seen above, there are to my knowledge no other Theme-in-PrtP accounts of prenominal adjectival participles. Sleeman's (2011) analysis of prenominal participles as specifiers of functional heads does not adopt the Theme-in-PrtP thesis: her participle phrase contains no equivalent of X in (8). However, she offers no way to capture the generalization in (9) and thus faces overgeneration problems similar to those besetting some of the analyses mentioned above.

Note finally that the web-attested data in (13) suggest that, *pace* Bresnan (1995), adjectival participles may predicate over fixed parts of idioms (including nominals like *hackles* in (13)a, which are for some speakers only usable in idiom chunks). These data perhaps have a somewhat metalinguistic flavor, but if further research establishes their legitimacy, then we

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[2] Exceptions like *confessed/recanted/drunk/experienced people* mostly involve state-changing Agents (Bresnan 1995; Haspelmath 1994:160f). However, these are rare, unproductive and unsystematic in English. There is no **dined/eaten person* despite similar cases in other languages noted by Haspelmath. *Learnéd person* is an archaically pronounced relic of Middle English *learn* 'teach'. For another perspective on resultative participles apparently predicated over external arguments, see Bruening (2012).

have a further argument against the approaches reviewed in this section (with the exception of the otherwise problematic idea that participles contain traces of predicated-over nominals).

(13)   a. If so, please explain with unraised hackles.
      b. We leave no stone unturned, no information unexplored, no advantage untaken in pursuit of the best defense for our clients
      c. Long may your bucket remain unkicked.
      d. leave no bandwagon unjumped on; leave a bandwagon unjumped

The manifestations of the generalisation in (9) seen above call for an approach where the predicated-over nominal is grammatically represented as an equivalent of an internal argument in clausal syntax, yet is merged externally, contra the prediction of the Uniformity of Theta Assignment Hypothesis (cf. Borer 2005:61ff). My implementation of this assumption must be postponed to section 5, since it requires us to discuss several other matters.

3   Implicit Initiators in adjectival participles

Adjectival participles are often taken to differ from verbal participles in lacking implicit Initiators (which I use as a cover term for Agents, Causers or other external arguments of V). I now argue that some adjectival participles do have implicit Initiators, a position also defended for Hebrew in Meltzer (2011), though mainly with different arguments.

3.1   Disjoint reference and coreference

The claim that adjectival participles lack implicit Initiators is often supported using contrasts like (14). The verbal participle in (14)a displays **disjoint reference** in that the passive subject and the implicit Agent cannot be coreferent, while the adjectival participle in (14)b allows a **coreferent** (reflexive) reading where John was the Agent of the dressing event.

(14)   a. John was being dressed up.   [verbal participle; disjoint reference]
      b. John seemed very dressed up.   [adjectival participle; coreference possible]

Disjoint reference and coreference are standardly taken to signal, respectively, the presence or absence of an implicit Initiator in a participial structure. For instance, Baker et al. (1989:224ff) argue that raising the Theme past a syntactically represented implicit Agent would incur a crossover violation if the two arguments are coreferent. This predicts that adjectival participles will not show disjoint reference effects if they lack implicit Agents (though the same prediction holds if their Themes are generated as external arguments and thus never raise past implicit Agents). Another account of disjoint reference is as follows. Implicit Initiators are existentially bound, i.e. interpreted similarly to *someone* (e.g. Bruening 2011). (14)a would trigger an implicature that this *someone* is not John, since nothing fulfils the need of natural languages to signal the reflexive interpretation. This account (unlike that of Baker et al.) can explain disjoint reference in (15)a. Like other implicatures, disjoint reference implicatures can be cancelled, for instance by adding *namely himself* after *someone* in (15)a or by the explicitly reflexive *by*-phrase in (15)b.

(15)   a. John was dressing up someone. / Someone was dressing up John.
      b. Marmaduke was admired by every stamp club member, including himself.

One might suggest that (14)a triggers an anti-coreference implicature because unambiguously coreferent active structures are available (*John was dressing (himself)*), while (14)b triggers no such implicature, as there is no competing reflexive-marked stative expression (**John seemed very self-dressed up*). However, this fails in (16). Under the interpretation where the underlined adverbs indicate the time of the verbal event and not the

result state, disjoint reference effects occur although there is no competing reflexive-marked construction (*the recently self-dressed people).[3]

(16)   a. die <u>soeben</u>   geschminkten Schauspieler (German; Roßdeutscher 2000:124)
            the just now   made up   actors
        b. the <u>recently</u> dressed/shaved/prepared people

The disjoint reference in (16) suggests that the participles have implicit Agents, but a proponent of the standard view that adjectival participles lack implicit Initiators could claim that the participles in (16) are not standard adjectival participles but the kind of ill-understood reduced relatives based on verbal participles noted in section 1. However, this does not extend to (17), where the participles do not have coreferent interpretations, although the context favors them. (The symbol # indicates that only irrelevant disjoint interpretations are possible, e.g. that others criticized John in (a).) The participles are predicative and thus not reduced relatives.

(17)   a. [#]John criticised himself, but to me he seemed unfairly <u>criticised</u>.
        b. [#]Some people trust themselves while others underrate themselves and think they won't succeed. Mary seems very <u>underrated</u> and not very <u>trusted</u>.
        c. [#]He had self-hate problems and remained very <u>hated</u> until he sought help.

Since adjectival participles show disjoint reference effects in (17), the coreference in (14)b is not predicted by the adjectival character of *very dressed up*. One may seek an alternative account of coreference effects which appeals to the fact that verbs like *dress up* which refer to commonly self-directed actions are crosslinguistically less likely than other verbs to demand unambiguous   reflexive   marking,   cf.   English   unmarked   reflexives   like   *I shaved/washed/dressed (up)* (see e.g. Kemmer 1993). Problems for such an account include (i) that it is unclear why cultural knowledge about the frequency of self-directed dressing events should more easily license coreference than the coreference-favoring contexts in (17), and (ii) that coreferent participles are not confined to canonically reflexive acts, witness (18). The participles in (18)a,b have e-stative uses as defined in section 1 (*my arm stayed attached/covered in skin*), and e-stative participles are standardly assumed to lack implicit Agents (e.g. Embick 2004, Meltzer 2011). However, I was unable to motivate e-stative readings for participles like those in (18)c-d.

(18)   a. The child rolled in the mud and remained <u>covered</u> in mud for hours.
        b. The protestor chained himself to the building and remained <u>attached</u> for a day.
        c. The Picts painted themselves blue and stayed <u>painted</u> for several days.
        d. Soon after his$_i$ suicide, the {<u>electrocuted</u>/*<u>shot</u>/*<u>stabbed</u>/*<u>killed</u>} man$_i$ was found.

Finally, an imaginable account of coreference in *dressed*-type participles which appeals to the debated unaccusative analysis of *dress*-type verbs will not work for the participles in (18).

  Unfortunately the above considerations leave me unable to explain the conditions licensing coreference with *dressed*-type participles. I doubt that satisfactory explanations will emerge until study of a large corpus of participles yields the correct descriptive generalisations on when coreference is possible. Despite these uncertainties, I conclude that disjoint reference effects, and hence implicit Initiators, are by no means excluded from adjectival participles.

3.2 Constraints on *by*-phrases

A frequent argument against implicit Initiators in adjectival participles comes from the degradedness of *by*-phrases in cases like (19)a. However, *by*-phrases are good if the *by*-phrase referent is responsible for continuing the state expressed by the participle, as in the

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[3] (16)b oddly suggests that the people dress/shave very rarely because *recently* sets up an interval lasting several days. *Soeben* 'just now' in (16)a does not cause this problem, but English has no semantically equivalent adverb which is usable in participles.

situation-in-progress participles in (19)b-d[4]. For fewer speakers, *by*-phrases are possible with resultative participles if the Initiator's sortal specifications are crucial for the nature of the state, which holds in (e) but not (a) and (f).

(19) a. The door seemed {broken/opened/painted} (*by Mary).
      b. The road remained {blocked by police/supported by pylons}.
      c. The dictator remained {unsupported/propped up/underestimated} by the warlords.
      d. Edeltraud seemed flattered by {the report/??the journalist}.
      e. %The text seems written by a {genius/foreigner/ghostwriter}.
      f. *The text seems written by John. He wouldn't have gone home without finishing it.

Similar observations are made for Hebrew by Meltzer (2011: sect. 3.2) and German by e.g. Maienborn (2007). Much like these authors, I claim that data like (19) follow if *by*-phrases are interpreted as *Initiators of the states expressed by the participles*[5]. With resultative participles from eventive verbs, the *by*-phrase referent's relation to the state is less direct, with concomitant reduced acceptability. Data like (19)e are better attested and more readily accepted than (a,f) since the Agent is more closely related to the state since, as Meltzer notes, the nature of the Agent is detectable from the nature of the state[6]. I conclude that some *by*-phrases with adjectival participles are unacceptable because they compose semantically with an already-stativised participle, not necessarily because the participles lack implicit Initiators.

  I should note several questions which must be bequeathed to future work. I cannot yet answer the interesting questions raised by Grimshaw's (1990:113-133) discussion of passives, notably of cases with obligatory *by*-phrases (*houses surrounded by trees; talks followed by questions*), which she analyses as unaccusative-based adjectival passives. It would also be interesting to ask whether Gehrke's (2012) finding that German *by*-phrases can attach either above or below participle morphology holds for English, and if so, whether different attachment heights relate to the different classes of participles seen in section 1 and to the different types of Initiators discussed in note 5. Compounds like *state-sponsored, self-professed, Beatles-inspired* will also repay further study. That the nonheads are grammatically represented as Initiator arguments is supported by data like *snow-capped* vs. *capped *(by snow)* noted by Grimshaw. Another question is whether the nonheads attach above or below participle morphology. If low attachment exists, then the 'internalisation' of the Initiator is an interesting challenge for theories of argument structure, notably the Voice hypothesis.

3.3 Purpose clauses

Contrasts like (20)a-b are another standard test for implicit Initiators in passives. Purpose clauses are (sometimes) degraded with adjectival participles but perfect with verbal passives, which is taken to show that the latter but not the former have implicit Agents which control PRO in the purpose clause.[7] For argument's sake I will concede that (20)b indeed involves control by an implicit Initiator and that the purpose clause in (20)a is not degraded due to the lack of an appropriate adjunction site below the participle affix.

(20) a. The idea seemed widely publicised (??in order to discredit him).

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[4] The reduced acceptability of the agentive reading in (19)d seems to be due whatever factors make it easier to form state-in-progress participles than event-in-progress participles. *flatter* is stative with a stimulus subject (*the report flatters her* is non-iterative) but eventive with an agent (*the journalist flatters her* is only iterative).

[5] *Initiator* is to be taken in a broad sense. With states it can be understood as an entity which controls the state or ensures its continuation, as in (19)b, or as a holder of the state, as in *unloved by their parents*. These and other Initiators arguably have in common that they make the situations possible, but whether this or another unified analysis is right is a complex issue which cannot be discussed here.

[6] A reviewer remarked that this entails that speakers who accept (19)e would also accept *This door seems painted by Picasso*, which however receives worse judgments than (19)e although the door's state could well permit one to identify the painter. I have no explanation for this (apparently definiteness-sensitive) contrast.

[7] I find a purpose clause worse with *The idea became widely publicised* than in (20)a. Perhaps this is because (20)a has some sort of ill-understood marginal construal as an elliptical variant of (20)b.

b. The idea seemed to have been widely publicised in order to discredit him.

c. The … bags remained closed in order to keep the modified atmosphere intact.

d. Use of the name Blohm + Voss remained prohibited, in order to … spare the world the shock that ships were being built there again.

e. The investigation launched by the prosecution remained limited in order to protect the police.

Nevertheless, questions about the usefulness of the purpose clause test emerge from web-attested and to me impeccable examples like (20)c-e). Here either the participles have implicit Initiators, or control is licensed in the same way as in clearly agentless contexts like *Grass is green to promote photosynthesis* (see e.g. Landau 2000:179ff). If the latter approach is adopted we must ask why this mechanism does not license the purpose clause in (20)a). I cannot yet explain these contrasts, but it appears legitimate to ask whether control can with any legitimacy be used as a test for implicit Initiators before such questions are resolved.

4   Unaccusative-based participles

In many recent accounts in the vein of Embick (2004) or Kratzer (2000), Voice or similar Agent-introducing heads are absent from resultative participles. The structures are thus in no sense passive, and participle-forming heads could in principle merge with projections of unaccusative verbs. However, as (21) indicates, unaccusative-based adjectival participles are not always possible. I will discuss this in fair detail, concluding that such participles, though productively formed, are subject to semantic constraints which do not beset transitive-based participles. There must therefore be participle formation rules which only apply to transitive verbs and therefore have a genuinely passive character.

(21)   a. the (recently) {departed/escaped/*left/*gone/*come/$^{(*)}$fled/$^{(*)}$entered} people

b. fallen {trees/leaves/soldiers/$^{??}$children/$^{??}$climbers}

c. an ascended {Christ/*mountaineer}

4.1   Unaccusative participles are productive with clear result states

One response to (21) is to deny that intransitives can feed productive resultative participle formation, and take one of the following positions on acceptable participles in (21).

I. Pesetsky (1995:116ff) argued that such participles are based on hidden transitives with implicit causers. Such hidden transitives are said to correspond to inchoatives with overt reflexives like French *se* (*la porte se ferme* 'the door closes'), which allow resultative participles (*la porte fermée* 'the closed door'). This claim is problematic given the lack of testable semantic correlates of the putative silent causer for verbs like *fall*, and given that French allows *un arbre tombé* 'a fallen tree', although *tomber* 'fall' never appears with *se*.

II. I initially hypothesised that current English forms resultative participles only from transitives, and that attested unaccusative participles are lexically listed heirlooms from an earlier period of the language. This would mean that current English resembles Hebrew on Meltzer's (2011) account while older English resembles German, in which unaccusative participles are less restricted (*abgelooste Typen* 'bummed-out guys' from recent slang *abloosen* 'become a loser/failure, lose out'). Haspelmath (1994:161) notes that unaccusative-based participles may disappear from languages when resultative participle morphology is reanalyzed as having a passivizing function. Such a change can hardly happen overnight, and one would expect a number of memorized unaccusative participles to survive for a time. However, (22) suggests that unaccusative participles are too common for one to want to deny that language learners derive productive generalisations from them, and we find tokens like *chilled-out people, lost-out people*, which seem to be based on recent intransitive verb uses.

(22)   failed/rested/lapsed/backslidden/Dutch-descended/returned/retired/vanished   people, deteriorated/decayed/capsized/rusted boat, wilted/faded flower, unerupted volcano,

flown-away bird, expired/run-out/elapsed licence, stuck window, hatched chicken, swollen/bloated hand, collapsed/fallen-over/caved-in building, defected spies

I thus assume that unaccusative participles are productively formed, but within certain limits. One such constraint is that the participles require *salient, relatively stable result states*. This explains the contrast in *grown {man/*[??]tree}*, since men but not trees have recognised full-grown states (A. Goldberg, p.c. in Bresnan 1995:12f). A reviewer noted that *fully grown tree* is acceptable, but here *fully* indicates that the speaker does not believe that the tree will grow further, so the result state is stable. In (21)b *climbers* is degraded since *the climbers fell* profiles a loss of footing and downward motion but no stable state. The grammatical irrelevance of the fact that most falling climbers end up on the ground is seen in *the climber fell in 10 seconds*, where the PP measures a pragmatically determined pre-event interval, not the event itself. By contrast, *the tree fell* is hard to conceptualise without the final tree-on-the-ground state evoked by *fallen tree*. One can rectify [??]*fallen children* by providing an explicit result state: *fallen-over children*. (21)c admits a similar account: *a mountaineer ascended* is atelic, and entails no goal, while *Christ ascended* describes an ascent to Heaven and not a goalless levitation act.

Even contrasts like *{escaped/*[(*)]fled} people* and *{departed/arrived/*left/*gone/*come} guests* are explicable. Unlike the others, *depart, arrive* and *escape* have resultative prefixes (cf. *detach, debar*; *attach, appear*; *emerge, emit*). That *fled people* is accepted by fewer speakers than *escaped people* is unsurprising given that *flee*, unlike *escape*, expresses an open-ended event and does not presuppose the Theme's initially having been in captivity: *I saw a lion, so I {fled/*escaped}*. It is also not clear that *go/leave* specifically encode results like 'not at the deictic centre'. *She is going/leaving* can describe acts before departure (packing, dressing, farewells), in contrast to clear result state cases (*Joe is escaping* is not yet true if Joe is making a hole in a jail wall). This and the confinement to human arguments (**the lion/letter went/left*) suggests that the verbs have shifted meanings expressing departure-related actions without result states. Note finally that **left people* and **entered people* suffer from problems of thematic ambiguity: is *people* interpreted as an argument of the intransitive or transitive uses of V (cf. *he was left by his wife*, *they were entered* (*in the file*) *by the secretary*).

I have not claimed that intransitives lacking clear result states are unergative and thus lack the internal arguments needed for participle formation. While some unacceptable participles in (21) might indeed involve unergatives rather than unaccusatives, most unaccusativity tests are unconcerned by intuitions as to whether e.g. *ascend* or *fall* have salient stable result states.

While the above analyses need further refinement, I will conclude that unaccusative participle formation is productive with verbs with salient, stable result states. Rejecting this in favour of position (II) above is not a better move given the testimony of (22).

4.2 Why are transitives are not subject to the result state requirement?

We now discuss various cases where the result state requirement on unaccusative participles does not affect transitive-based participles. Some such asymmetries have principled explanations, but others seem to require us to posit rules specific to transitive verbs, as is expected in a theory which acknowledges the existence of adjectival *passives* in English.

Firstly, unaccusative participles cannot have situation-in-progress readings. Intransitive state verbs cannot form participles analogous to those in (5) (*depressed people* vs. **existed/remained exceptions, *odd-sounded ideas*). Event-in-progress participles like (4) (*well-played flutes*) lack unaccusative counterparts (we find nothing like *fallen leaves* in the sense 'leaves which are falling'). However, these interpretations of unaccusative participles are plausibly blocked by –*ing*-participles, which are freely formed with intransitives and express in-progress situations (*existing/remaining exceptions*; *odd-sounding ideas; falling leaves*).

The real difficulties come from resultative participles like (23)[8]. These are not related to verbs which lexicalise state changes. *I swept the floor but this had no effect on it* is no contradiction. Analysing *read* as meaning 'cause to become read' risks circularity. Trying to use telicity effects seen with *read* as an argument for this decomposition would be of little avail given that *play the piano* cannot be telic.

(23) a. [(?)]The patient is already massaged, so we needn't ring the physiotherapist.
      b. [(?)]The floor is already swept.
      c. unread books, unplayed pianos, well-studied phenomena, lovingly patted cats

We thus face a paradox: *unplayed pianos* is better than **already gone guests*, although *play the piano* has no result state while *go* at least has an implied endstate ('not here'). Or if *play* does have an implied result state arising from the fact that one can *affect* pianos by playing them (albeit an unusual 'result state' which does not produce telicity effects), one wonders why such affected states are not exploited in unaccusative participle formation.

An unpromising way of explaining asymmetries between transitive and intransitive participles would be to enlist the idea that transitive-based participles are zero-derived from verbal passive participles and intransitive participles from perfect participles (Bresnan 1995, Grimshaw 1990:125, Levin & Rappaport 1986:654 note 36). This cannot predict the constraints on intransitive-based participles since perfects allow non-result-state verbs, even unergatives: *They have worked* vs. **worked people*.

Thus, it seems empirically necessary to posit two distinct resultative participle formation processes, one applicable to result state verbs, including unaccusatives, and one with more liberal semantic input conditions which is applicable to transitives only and is thus genuinely passive. A unified analysis which captures all the facts discussed above would be desirable, but this does not seem empirically feasible to me.

5 Semantic and syntactic analyses

5.1 Transitive resultative participles, externalisation and implicit initiators

This section analyses the use of participle morphology responsible for forming resultative participles from transitive verbs (unaccusative participles, a separate problem, are discussed in sect. 5.2). It also discusses the mechanics of realisation of Themes and implicit Initiators. My discussion will be an elucidation of the properties of the relevant use of the participle morpheme (henceforth abbreviated **Prt**) stated in (24).

(24) Properties of Prt in the resultative reading found with transitive verbs:
  a. Semantics: $\lambda s\ \lambda x\ \lambda P\ \exists e\ \exists y\qquad P(x)(e)\ \&\ \text{CAUSE}(s)(e)\ \&\ \text{INITIATOR}(e)(y)$
      (s is a state variable, e an event variable, P an event property contributed by the verb)
  b. Argument structure: VP; N-projection (external)
  c. Category: A
  d. Voice: Prt is a passive Voice head which only combines with transitive V-projections and does not license the syntactic projection of an Initiator.

Caused states: The CAUSE-relation in (24)a assumes that the participle expresses a state directly caused by the event named by V. *The car is wrecked* asserts that the car is in a state caused by a wrecking event. This idea is not new (see e.g. Meltzer 2011). It is also not crucial to my main proposals here, which could be adapted to accommodate other semantic analyses of resultative participles (say Gese 2011, Gehrke 2012, Kratzer 2000, Maienborn 2007). What is crucial is that the semantic representation must license resultative participles from transitive verbs lacking result states (recall (23)). (24)a allows this: *a massaged patient* is in a state caused by a massaging event (on the resultative reading, not the event-in-progress reading).

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[8] I find (23)a,b strained, but not bad enough to justify ignoring them. Gehrke (2012) makes similar remarks for German. The participles are perfect in prenominal position, recalling the ill-understood issues attending (2)d.

The semantic representation for Prt in its unaccusative-compatible resultative use must exclude such interpretations; see the next section. More is said on (24)a shortly.

Argument structure: (24)b requires the participle to take an N-projection (including extended projections like DP) as an argument. It must be an *external* argument, witness *It seemed* [AP *very* [AP *the car damaged*]]. This externality requirement could alternatively be derived from a stipulation that A *modifies* N and the traditional assumption that arguments of modifiers are realised outside the modifiers' projections. It may also be that any information about nominal arguments in (24)b is not stipulated but derived from the adjectival character of the participle (Levin/Rappaport 1986:646; Meltzer 2011).

(24)b assumes that Prt merges with VP, but my main proposals are not harmed if Prt directly merges with V° (with phrasal dependents of V merging above Prt). A complete version of (24) would have to address morphological issues raised by VP attachment, for instance the fact that Prt is not spelt out as a phrasal affix but as an operation on an inflectional verb stem: *{broken-open/*break-opened} boxes*. Such PF-branch problems are orthogonal to my main claims.
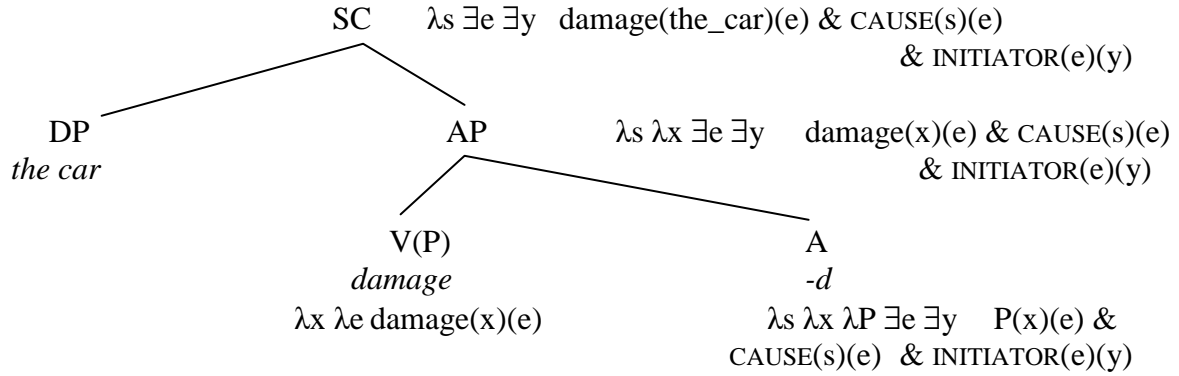
Voice and implicit initiators: (24)d assumes that Prt is an adjectival Voice head, much as *–er* in *drivers of cars* is arguably a nominal Voice head. Specifically, Prt is a *passive* Voice head, since it only merges with transitive verbs, projects no overt Initiator in syntax and can license *by*-phrases (sect. 3.2). In accord with the finding that adjectival participles can have implicit Initiators (sect. 3.1), (24)a includes an existentially bound argument, y, characterized as an Initiator.

Sect. 3.2 argued that *by*-phrases compose semantically with the participial state, not with the verbal event. There are two ways of enforcing this. Firstly, we could assume that *by*-phrases blindly introduce *Initiators of situations expressed by passive Voice projections*, which means that they must be interpreted as State Initiators in the case at hand. The State Initiator is identified with the Initiator in the final conjunct in (24)a because the Initiator of an event causing a state will automatically be the Initiator of the state. Secondly, one could capture the State Initiator requirement directly by replacing the final conjunct in (24)a with INITIATOR(s)(y). In that case we need only assume that the *by*-phrase's task is to realize this Initiator overtly. The second approach makes the observation that *by*-phrases are interpreted as State Initiators in English, German and Hebrew (see sect. 3.2) look coincidental. It would only be warranted if subsequent research finds languages not fitting this pattern.

The state-related nature of *by*-phrases led me to assume that passivisation and stativisation are achieved by a single head, Prt. A syntactic derivation which posits a stativising head above a passive Voice head would have to assume that the *by*-phrase merges above the stativiser, but I see no natural way of policing this requirement. Putting the stativiser below Voice is undesirable as it would interrupt the usual Voice-VP adjacency.

Theme externalization: I assume that the merging of Themes outside participle projections (sect. 2) involves λ-abstraction of V's object, as do Bruening (2012) and Meltzer (2011: sect. 5.3). My variant of this idea is as follows. (24)a requires that Prt combine with a V with a λ-abstracted argument, x. Put otherwise, it combines with an *unsaturated predicate* (see Bruening 2011, 2012 and Labelle 2008 for precedents for this in various domains). (24)b indicates that the participle takes an N-projection as an external argument. This will be automatically identified with the λ-abstracted argument in the semantics, since there would be no other source for its interpretation. (25) illustrates the workings of Theme externalisation more concretely. For simplicity's sake I ignore the possibility that small clauses involve functional heads.

(25) Small clause in *The car seemed damaged.*

SC $\lambda s \exists e \exists y$ damage(the_car)(e) & CAUSE(s)(e)

& INITIATOR(e)(y)

DP AP $\lambda s \lambda x \exists e \exists y$ damage(x)(e) & CAUSE(s)(e)

the car & INITIATOR(e)(y)

V(P) A

damage *-d*

$\lambda x \lambda e$ damage(x)(e) $\lambda s \lambda x \lambda P \exists e \exists y$ P(x)(e) &

CAUSE(s)(e) & INITIATOR(e)(y)

Are less stipulative accounts of externalization possible? (24) captures externalisation by stipulating the syntactic N-projection argument and the requirement that Prt merge with a VP with an open entity argument. Perhaps the unsaturated predicate requirement can be derived from the need to provide an interpretation for the N-projection (whose presence may in turn follow from a theory of the nature of adjectives, as noted above). For such a reductionist account to be convincing, one must exclude the possibility that a legitimate interpretation for the N-projection could be provided by purely pragmatic reasoning. I do not know if this is feasible. Cases like **car-damaged people* ('people whose cars are damaged') and others in (10) are interpretable, yet unacceptable, occasioning doubts as to whether we can reduce the unsaturated predicate requirement to the need for the N-projection to receive an interpretation.

5.2 Other types of participles

Sect. 5.1 covered my main concerns, Theme externalisation and implicit Initiators, illustrating these with transitive resultative participles. This section makes the account more complete by sketching analyses for situation-in-progress and unaccusative resultative participles.

  Situation-in-progress participles: The variant of Prt responsible for situation-in-progress participles like those in (4) and (5) differs from that of transitive-based resultative participles mainly in lacking the causal relation included in (24)a. The participles are thus passive but not resultative. The use of Prt in situation-in-progress participles would thus be represented as in (24), but with (24)a replaced by a simpler semantics, say (26). Here sn, the situation variable for the state/event described by V, is equated with the state variable introduced by Prt. In event-in-progress participles (*well-played flutes*) the verbal event must be construed as a state, which may account for the marginal nature of such participles.

(26) $\lambda s \lambda x \lambda P \exists sn \exists y$ P(x)(sn) & INITIATOR(sn)(y) & s = sn

  Unaccusative resultative participles involve a variant of Prt which differs from that in (24) in two ways. Firstly, they lack implicit Initiators, which can be handled by omitting the information about Voice in (24)d. Secondly, unaccusative participles are confined to result state verbs, unlike their transitive cousins (sect. 4). The causal relation in (24)a would overgenerate for unaccusatives: (24)a does not exclude **fled people* in the sense of people in a state (e.g. non-captivity) caused by a *fleeing*-event. The causal semantics should be replaced by a representation in which the participle morphology picks out a state which is an intrinsic part of the situation named by V. (27) is one suggestion in this direction. Here P is the event property expressed by the verb and Q is some property of the state whose variable is contributed by Prt. By the final conjunct, an event for which P is applicable entails a state for which Q is applicable.

(27) $\lambda s \lambda x \lambda P \exists e$ P(x)(e) & Q(x)(s) & [P(x)(e) $\rightarrow$ Q(x)(s)]

  I have not given a unified analysis of the three readings of Prt (or four if we include e-stative participles, which are not analysed here), since unifying the readings of Prt would ride

roughshod over several facts noted here. The idea that the four types of participles can be derived using two features [passive] and [resultative] is oversimplified given e.g. that transitive and unaccusative resultative participles involve different types of resultativity (sect 4.2). That the various readings of Prt mostly trigger the same allomorphy follows from their historical relatedness (see Haspelmath 1994 for explanations for the crosslinguistic association of perfective and passive participle markers). Historical relatedness does not justify a unified synchronic analysis which ignores semantic details.

6   Conclusion

The main claims made above about English adjectival participles include that they do not have internal Theme arguments, that they often have implicit Initiators and that we must distinguish between different resultative interpretations in transitive-based and unaccusative-based participles. Whether or not my analyses are right, this study raises several questions deserving further work, concerning for instance (i) the distinction between normal adjectival participles and reduced relatives involving verbal participles (sect. 1), (ii) the reasons for the confinement of some participles to attributive use (sect. 1), (iii) the nature of the previously unrecognised class of situation-in-progress participles (sect. 1), (iv) the conditions licensing coreferent interpretations in adjectival participles (sect. 3.1), (v) the licensing of *by*-phrases (sect. 3.2), (vi) the causes for, and precise nature of, the differences between unaccusative and transitive resultative participles (sect. 4.1), and (vii) the exact mechanism responsible for externalisation of Theme arguments (sect. 5.1).

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