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 several (partly new) semantic classes of them. Section 2 argues that Themes in adjectival participles are external arguments, unlike Themes in standard passives. Section 3 critically assesses the standard arguments against implicit Agents in adjectival passives. I show that many adjectival participles do not 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 gives an explicit syntax and semantics for adjectival participles.

Some caveats: This study raises more questions than it answers, but many of them are new and, I hope, worthwhile. At some points I may be accused of excessive zeal in arguing against elegant, stipulation-free accounts. This is not a sign of fealty to some antiscientific anything-goes framework, but of doubts that the large set of (both familiar and previously undiscussed) data treated here allow stipulation-free analyses. This essay will have been to some avail if it inspires 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 2011a, note 1). This is especially clear for postnominal participles, witness e.g. the tolerance in (2)a) of

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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 irrelevant verbal reading asserts an event which caused the Theme not to be in a wrapped state, while the relevant adjectival reading never entails that any event occurred.

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 (b) where bad driving has affected the car). In (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.
  d. 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 argument')

are initially merged in (verbal projections inside) projections of adjectival participles. I argue that the underlined trace in (6) is not motivated, unlike the trace in the canonical passive in (7)a) (which draws support e.g. from (7)b)). My position is related to the notion in lexicalist work of **externalization** of Themes in adjectival participles (Levin & Rappaport 1986, Meltzer 2011a). I will also speak of *externalisation,* though I do not attribute externalisation effects to a lexical (or for that matter, syntactic) operation.

(6)   *I consider* [$_{SC}$ *the book* [$_{AP}$ *overrat-ed*   [$_{VP}$ t$_{overrate}$ t$_{\underline{the.book}}$]]].

(7)   a. <u>*Massive systems of concrete dams*</u> *were built* t$_{massive...dams}$ *on the river sides.*
              b. *There were built* <u>*massive systems of concrete dams*</u> *on the river sides.* (attested)

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, Italian *ne*-cliticisation (Borer 2005:61ff, Meltzer 2011a: sect 5.3, Cinque 1990:36f).

2.1   Coordination and ATB

Meltzer (2011b) provides an argument against the Theme-in-AP analysis of adjectives, which I will adapt to adjectival participles here. The argument exploits two observations about (8)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 (8)a,b) can only scope over the adjectival participles and not over *likely*. (8)c) gives the syntax for the illicit reading in which *very* includes *likely* in its scope.

(8)   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 <u>t$_{they}$</u>] 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 formation does not involve VPs containing traces of theme arguments, then we explain the unacceptability of (8)c) simply. *They* moves out of one conjunct but not the other, violating the Coordinate Structure Constraint. If we posit the underlined trace in (8)d), then the CSC argument is unusable and the structure's unacceptability has no clear source. (8)e) shows that there is no problem with wide-scope *very* if the second conjunct contains a non-raising adjective. A final point is that the acceptable interpretation involves either coordination of small clauses (or comparable constituents) as in (8)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 probably the most obvious way of implementing the Theme-in-PrtP analysis is as in (9). Here the participle projection has a silent Theme, labeled X. To capture the generalisation in (10), X would have to be coindexed with the modified N.

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

(10)   DIRECT ARGUMENT GENERALISATION: Adjectival participles always modify nominals corresponding to direct objects (unaccusative subjects) of their related verbs.[2]

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[2] Exceptions like *confessed/recanted/drunk/experienced heretics* involve state-changing Agents (Bresnan 1995; Haspelmath 1994:160f). However, these are rare and presumably unproductive in English. There is no **dined/eaten person* despite similar cases in other languages noted by Haspelmath. Some examples cited by

What kind of item could X be? X is not a trace of *boss* given any normal view of movement. If X is PRO, then (10) is most naturally captured by assuming that D controls PRO and binds the referential argument of the modified N. But this cannot be right since the generalisation in (10) holds even for phrasal compounds like (11)a, where the modified N *manuscript* does not have its own determiner, cf. (11)b. (This problem also arises if we police (10) by analysing X as an empty N whose reference is established by a c-commanding D.)

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

Even if there were a candidate for X_i in (9) whose coindexation with *boss* were expected, it would still be unclear what forces V's complement position to be occupied by X_i rather than some other non-case-requiring item (call it Y) whose identity with the modified N is not forced. There are at least two candidates for Y. Firstly Y could be arbitrary PRO, so that *shaved barbers* means 'barbers who shave people'. Such arbitrary PRO object interpretations are attested with many –*ing*-participles, cf. e.g. (12).

(12)   pleasing performances, filling meals, rewarding tasks

Secondly, it is unclear why Y could not be an incorporated nominal which realizes V's theme argument, allowing structures which disobey (10). (13)a,b illustrates the unacceptability of such structures. There are exceptions like (13)c, but these are sporadic and unproductive (Marchand 1969:93f).

(13)   a. *It 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*)

The inability of a putative PrtP-internal Theme to incorporate is all the more suspicious given the commonness of incorporation of most other dependents in adjectival passives (14) and of theme incorporation in adjectival –*ing*-participles (15). (Unlike adjectival passives, *-ing* participles have internal Theme arguments, realised as either empty categories (12) or compound nonheads (15). Such participles predicate never predicate over the object of a transitive verb: *rotting leaves* does not mean 'leaves that rot things' and *shaking people* does not mean 'people who shake things'.)

(14)   a. <u>Agent, Originator etc.</u>: *human-made, Beatles-inspired, user-owned, Godforsaken,*
         taxpayer-funded, self-{made/anointed}, moth-eaten, flea-bitten, navy-protected,
         expert-approved, sun-dried, data-driven, computer-aided, drug-induced
     b. <u>PP complement</u>: *data-based* (cf. *based on*), *health-related, gold-plated*
     c. <u>Instrument</u>: *hand-woven, password-protected, force-evacuated, bottle-fed*
     d. <u>Location</u>: *pan-fried, home-made, land-based, heartfelt, base-generated*
     e. <u>Adverbial</u>: *much-loved, well-made, oft-derided, hard-won, ill-chosen, clean-cut,*
      fresh-oiled, newfound, ready-made, stillborn, widespread

(15)   *hotel-wrecking (rockstars), meat-eating (cows), self-esteem-destroying (data),*
      structure-preserving, life-affirming, brain-melting, life-changing, self-defrosting,
      death-defying, life-giving, mind-altering, pipe-smoking, fun-loving, lie-telling, mind-
      numbing, ego-destroying, harmony-fostering, drug-using, hackle-raising

Thus, (9) cannot capture the generalisation in (10) naturally, a problem which we do not have if Themes of adjectival participles are always generated externally. The problems discussed here may explain the absence of analyses like (9) in the literature.

  One of the few syntactic analysis of prenominal participles is given by Sleeman (2011). She treats prenominal participles as specifiers of functional heads above N, but her participial

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Bresnan have other analyses. *Learnéd person* is from Middle English *learn* 'teach', hence its archaic pronunciation. Cases like *prepared/well-behaved pupils* could involve reflexive verb uses.

projection contains no theme argument, unlike PrtP in (9). In this I agree with her, but I will comment on a problem with her proposal. She assumes that the verbal root does not project a theme argument in prenominal participles (for reasons discussed inconclusively in note 11). The account lacks an empirical equivalent of externalisation, leaving her unable to capture the generalisation in (10) and the idiom data in (16) (which are attested, *pace* Bresnan 1995).

(16) a. unraised hackles/ire   [cf. *raise X's hackles/ire*: anger X]
          b. leave no advantage untaken
          c. reinvented wheels

My account of the workings of Theme externalisation effects will be postponed to section 5, since it presupposes discussion of several issues other than externalisation.

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 (2011a), though mainly with different arguments.

3.1   Disjoint reference and coreference

A common test which is meant to show that adjectival participles differ from verbal participles in lacking implicit Initiators is seen in (17). (17)a displays **disjoint reference**, i.e. the passive subject cannot be coreferent with the implicit Agent. By contrast (17)b allows a **coreferent** (reflexive) reading, where John could have been the Agent of the dressing event.

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

The disjoint reference effect is standardly attributed to the presence of implicit Initiators in verbal passives. For instance, Baker et al. (1989:224ff) derive disjoint reference effects by assuming that raising the theme past a (syntactically represented) implicit Agent incurs a crossover violation. A perhaps preferable alternative is to treat disjoint reference as an implicature. The Initiator is existentially bound, i.e. interpreted similarly to *someone*. In (17)a this *someone* could in principle be John, but this interpretation is disfavored because nothing fulfills the need of natural languages to signal the reflexive interpretation explicitly. This also rightly predicts disjoint reference in (18)a. Like other implicatures, disjoint reference implicatures can be cancelled, for instance by adding *namely himself* after *someone* in (18)a or by the explicitly reflexive *by*-phrase in (18)b.

(18) 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 (17)a triggers an anti-coreference implicature because unambiguously coreferent active structures are available (*John was dressing (himself)*), while (17)b triggers no such implicature since no competing reflexive-marked stative expression exists (**John seemed very self-dressed up*). However, this fails in (19). If the underlined adverbs refer to the time of the verbal event, disjoint reference effects are triggered despite there being no competing reflexive-marked construction (**the recently self-dressed people*).[3]

(19) 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

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[3] (19)b oddly suggests that the people dress/shave very rarely because *recently* sets up an interval lasting several days. *Soeben* 'just now' in (19)a does not cause this problem, but English has no semantically equivalent adverb which is usable in participles.

The disjoint reference in (19) suggests that the participles have implicit Agents, but the structures are probably reduced relatives involving verbal participles (sect. 1), in which case they tell us nothing about adjectival participles. However, previously unnoted data like (20) provide clearer cases of adjectival participles with disjoint reference. Participles like those in (20)a may have reduced relative readings, but *underrated* and *trusted* have clear adjectival readings (*very trusted/underrated people*) which could in principle be applicable in (a). Anyway, (d) shows adjectival *so*-modification and is predicative and thus no reduced relative.

(20) a. Some people trusted themselves and others underrated themselves. #The <u>underrated</u> people performed better than the <u>trusted</u> ones in the experiment.
  b. One politician criticised himself in public. #Some party members thought that the <u>criticised</u> politician had harmed the party's reputation.
  c. Four sect members obeyed the guru's exhortation to kill themselves. #The way the authorities handled this was an insult to the relatives of the four <u>killed</u> people.
  d. The company's boss pays himself 1.5 million a year. #It is because he is so <u>overpaid</u> that the company is about to go bust.

(20) shows that the coreference in *very dressed-up people* is not automatically predicted by the participle's being adjectival. We are likewise poorly served by a purely pragmatic account of coreference in *dressed people* which appeals to the fact that *dress*-events are often reflexive, since it is unclear why such cultural knowledge should be better able to license coreference than the coreference-favoring contexts in (20). It is true that verbs naming canonically reflexive acts are crosslinguistically less likely than other verbs to demand unambiguous marking of reflexivity, English unmarked reflexives like *I dressed/shaved/washed/prepared* being an extreme case (e.g. Kemmer 1993). Meltzer (2011a: sect. 5.6.2) noted that Hebrew adjectival passive templates double as reflexive markers with such verbs, but this cannot be easily adapted to English: to claim that adjectival *dressed* allows coreference because *I dressed* need not overtly signal reflexivity fails in (21)a, which is coreferent despite *She made *(herself) up*. Analogous problems affect other (e.g. Romance and Germanic) languages lacking covertly reflexive verbs, cf. e.g. (21)b,c).

(21) a. She seemed rather too <u>over-made-up</u> for the word 'tasteful' to come to mind.
  b. Die Schauspieler schminkten *(sich).   (German)
    the actors   made.up   REFL
    "The actors put on makeup."
  c. die   geschminkten Schauspieler   (possibly coreferent)
    the   made.up   actors

Even more vexingly, coreferent participles are not confined to canonically reflexive acts, witness (22). The participles in (a,b) have e-stative uses (*my arm stayed attached/covered in skin*), and the lack of events in e-stative participles correlates with a lack of implicit Agents (e.g. Embick 2004, Melzer 2011a). This tempts us to assimilate *dressed*-type participles to e-stative participles, but then the question of what licenses coreference mutates into the even harder question of what licenses e-stative readings of participles, including participles like those in (22)c-d for which e-stative readings seem otherwise unavailable.

(22) 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 (22).

  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 (23)a. However, *by*-phrases are good if the *by*-phrase referent is responsible for continuing the state expressed by the participle, as in the situation-in-progress participles in (23)b-d. (Note w.r.t. (d) that *flatter* tests as stative with a stimulus but eventive with an agent: *the journalist flatters her* is iterative, unlike *the report flatters her*.) For fewer speakers, *by*-phrases are possible with resultative participles if the Initiator's sortal specifications are crucial for the nature of the state, cf. (e,f).

(23) 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 (2011a: sect. 3.2) and German by e.g. Maienborn (2007). Much like these authors, I claim that data like (23) follow if *by*-phrases are interpreted as Initiators[4] relating to the states expressed by the participles. With resultative participles from eventive verbs, the *by*-phrase referent's relation to the state is harder to establish, with concomitant reduced acceptability. Data like (23)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. I conclude that some *by*-phrases with adjectival participles are unacceptable because they merge with an already-stativised participle, not necessarily because the participles lack implicit Initiators.

  Several important questions must be bequeathed to future work. As yet I cannot 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 English resembles German in allowing *by*-phrases to attach either before or after participle morphology (e.g. Gehrke 2011), and whether such distinctions, if they exist, relate to the different classes of participles seen in section 1 and to the different types of Initiators discussed in note 4. Compounds like *government-sponsored, self-professed, Beatles-inspired* will also repay further study. That the nonheads are grammatically represented as Initiator arguments is perhaps supported by data like *snow-capped* vs. *capped* *(*by snow*) noted by Grimshaw. Contrasts like *moth-eaten* vs. **child-eaten* obey constraints on *by*-phrases, but more data must be studied to compare this account to a competing account relying on nameworthiness constraints on semiproductive compounding patterns. 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 (24)a-b are another standard test for implicit Initiators in passives. Purpose clauses are (sometimes) degraded with adjectival participles but perfect with verbal passives,

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[4] *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 (23)b), or as a holder of the state, as in *unloved by their parents*. The common feature of these and other Initiators is perhaps that they are *enablers* of situations, but whether this or another unified analysis has empirical reality is a complex issue which cannot be broached here.

which is taken to show that the latter but not the former have implicit Agents which control PRO in the purpose clause.[5] For argument's sake I will concede that (24)b indeed involves control by an implicit Initiator and that the purpose clause in (24)a is not degraded due to the lack of an appropriate adjunction site below the participle affix.

(24) a. The idea seemed widely publicised ($^{??}$in order to discredit him).
      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. The ends of arteries remained opened in order to improve gas exchange

Nevertheless, questions about the usefulness of the purpose clause test emerge from attested and to me impeccable examples like (24)c,d. 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 (24)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 (2002), 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 (25) indicates, unaccusative-based adjectival participles are not always well-formed. This section discusses the nature of such blockages. I will conclude that, although such participles are probably productive, they are subject to semantic constraints which do not beset transitive-based participles. There must therefore be certain participle formation rules which only apply to transitive verbs and are therefore have a genuinely passive character.

(25) 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 (25) is to deny that intransitives can feed productive resultative participle formation, and take one of the following positions on acceptable participles in (25).

  I.Pesetsky (1995:116ff) argued that such participles are based on hidden transitives with implicit ambient causer arguments. Such hidden transitives are said to correspond to inchoatives featuring overt reflexive morphology in languages like French (*la porte se ferme* 'the door closes' and *la porte fermée* 'the closed door'). Appealing to this without further testing risks circularity given e.g. the lack of transitive uses of *fall*-type verbs and of testable semantic correlates of the putative silent causer.

  II. Earlier versions of this work hypothesised that modern English forms resultative participles only from transitives, and that attested unaccusative participles are lexically listed heirlooms from an earlier period of the language. In this modern English resembles Hebrew on Meltzer's (2011a) account while older English resembles German (which allows new formations like *abgelooster Linguist* 'failed linguist' (< *abloosen* 'fail, become a loser'). 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, so that a number of memorized

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unaccusative participles would be expected to survive for a time. Be that as it may, (26) suggests that unaccusative participles are too common for one to want to deny that language learners can 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.

(26) 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 productive, but within certain constraints. 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 culturally recognised full-grown states (A. Goldberg, p.c. in Bresnan 1995:12f). In (25)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 climbers fell in a minute*, where the PP measures a pre-event interval, not the interval before they hit the ground. By contrast, *the trees fell* is hard to conceptualise without the final trees-on-the-ground state evoked by *fallen trees*. One can rectify [??]*fallen children* by providing an explicit result state: *fallen-over children*. (25)c admits a similar account: *a mountaineer ascended* is atelic, and entails no goal, while *Christ ascended* describes an ascent to Heaven rather than a goalless levitation act.

Even contrasts like *{escaped/*[(*)]fled} people* and *{departed/arrived/*left/*gone/*come} guests* are arguably principled. Unlike the others, *depart, arrive* and *escape* have resultative prefixes (cf. *detach, debar*; *attach, appear*; *emerge, emit*). The (speaker-specific) unacceptability of *fled 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* explicitly 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 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 (25) 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 (26).

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 leaf* in the

sense 'a leaf which is 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 (27)[6]. These are not related to verbs which explicitly 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 verbs like *play* have no telic uses.

(27)   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
        d. The die is cast.

We thus face a paradox: *unplayed pianos* is better than **already gone guests*, although *play* 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 a more liberal rule applicable to transitives only. I would welcome a unified analysis which succeeds in predicting all the facts discussed above, but at present I see no alternative to positing a use of participle morphology which applies only to transitives and is thus genuinely passive.

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 (28), which gives the features of the relevant use of the participle morpheme (henceforth abbreviated **Prt**).

(28)   Features of Prt in the resultative reading found with transitive verbs:
        a. Semantics: $\lambda s\, \lambda x\, \lambda P\, \exists e\, \exists y$ $P(x)(e)$ & CAUSE$(s)(e)$ & 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 (realised outside PrtP)
        c. Category: A
        d. Voice: Prt is a 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 (28)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

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caused by a wrecking event. This idea is not new (see e.g. Meltzer 2011a). 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 2011, Kratzer 2002, Maienborn 2007). What is crucial is that the semantic representation must license resultative participles from transitive verbs lacking result states (recall (27)). (28)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). The semantic representation for Prt in its unaccusative-compatible resultative use must exclude such interpretations; see the next section. More is said on (28)a shortly.

Argument structure: (28)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 idea that arguments of modifiers are realised outside the modifiers' projections. It may also be that any information about nominal arguments in (28)b is not stipulated but derived from the adjectival character of the participle (Levin/Rappaport 1986:646; Meltzer 2011a).

   (28)b assumes that Prt merges with VP, but my main proposals would not be harmed if Prt directly merges with V° (with phrasal dependents of V merging above Prt). A complete version of (28) would have to address the 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*. To my knowledge such PF-branch problems are orthogonal to my main claims.

Voice and implicit initiators: (28)d assumes that Prt is a kind of 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 and projects no overt Initiator in syntax. Like other passive Voice heads, Prt can license *by*-phrases (sect. 3.2).
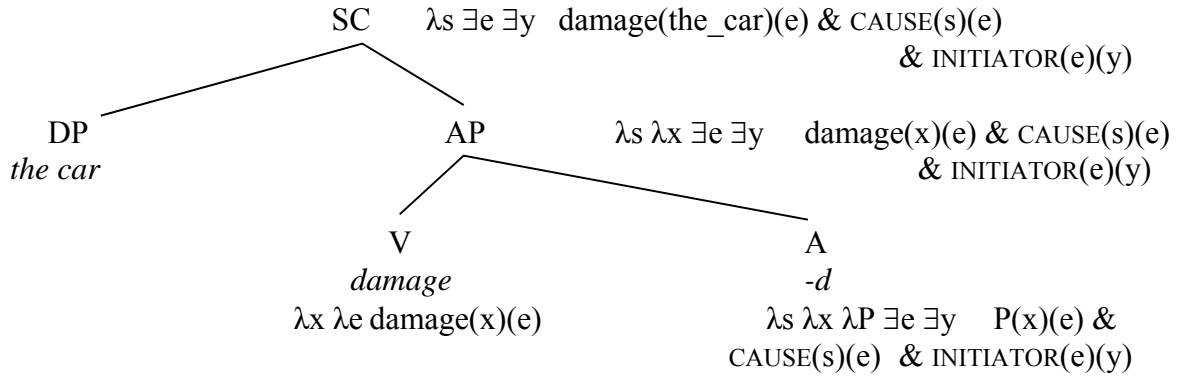
   In accord with the finding that many adjectival participles have implicit Initiators (sect. 3.1), (28)a includes an existentially bound argument, y, characterized as an Initiator. Sect. 3.2 argued that *by*-phrases apply to the participial state, not just to the verbal event. There are two ways of enforcing 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 a State Initiator in the case at hand. The State Initiator is identified with the Initiator in the final conjunct in (28)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 (28)a with INITIATOR(s)(y). In that case we need only assume that the *by*-phrase's task is to realize this Initiator overtly. I prefer the first approach because Voice heads normally deal with a conceptual argument of the embedded V (i.e. of the event in our case). The second approach seems to characterise the State Initiator interpretation as an arbitrary parameter setting. This may be valid if there are languages with adjectival passives which work as in English except that they have event-related *by*-phrases (unlike German and Hebrew, cf. sect. 3.2). Crosslinguistic study of this would be of some interest.

   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 is also proposed in Meltzer (2011a: sect. 5.3). My variant of this idea is as follows. (28)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 and Labelle 2008 for precedents). (28)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. (29) illustrates the workings of Theme externalisation more concretely. For simplicity's sake I ignore the possibility that small clauses involve functional heads.

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

$$\text{SC} \quad \lambda s \, \exists e \, \exists y \ \ \text{damage(the\_car)}(e) \ \& \ \text{CAUSE}(s)(e)$$
$$\& \ \text{INITIATOR}(e)(y)$$

DP *the car*

$$\text{AP} \quad \lambda s \, \lambda x \, \exists e \, \exists y \ \ \text{damage}(x)(e) \ \& \ \text{CAUSE}(s)(e)$$
$$\& \ \text{INITIATOR}(e)(y)$$

V *damage*
$$\lambda x \, \lambda e \ \text{damage}(x)(e)$$

A *-d*
$$\lambda s \, \lambda x \, \lambda P \, \exists e \, \exists y \ \ P(x)(e) \ \&$$
$$\text{CAUSE}(s)(e) \ \& \ \text{INITIATOR}(e)(y)$$

Are less stipulative accounts of externalization possible? (28) 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 (13) seem 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), (5) differs from that of transitive-based resultative participles mainly in lacking the causal relation included in (28)a. The participles are thus passive but not resultative. The use of Prt in situation-in-progress participles would thus be represented as in (28), but with (28)a replaced by a simpler semantics, say (30). 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 structures.

(30) $\lambda s \, \lambda x \, \lambda P \, \exists sn \, \exists y \quad P(x)(sn) \ \& \ \text{INITIATOR}(sn)(y) \ \& \ s = sn$

   Unaccusative resultative participles involve a variant of Prt which differs from that in (28) in two ways. Firstly, they lack implicit Initiators, which can be handled by omitting the information about Voice in (28)d. Secondly, unaccusative participles are confined to result state verbs (sect. 4.1), unlike their transitive cousins. The causal relation in (28)a would overgenerate for unaccusatives: (28)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 intrinsically connected to the situation named by V. (31) 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.

(31) $\lambda s \, \lambda x \, \lambda P \, \exists e \quad P(x)(e) \,\&\, Q(x)(s) \,\&\, [P(x)(e) \rightarrow Q(x)(s)]$

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 there is a split between passive-like and unaccusative-based participles. However my analyses are evaluated, 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 usually 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).

7   References

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