

Verbal Prefix Selection and Scalarity

Abstract. I derive the contrasting syntactic behaviour of the English verbal prefixes *out-* and *over-* as well as their semantic and combinatorial properties, from their different syntactic positions, where *out-* is in proc(ess)P, while *over-* is in res(ult)P.

Then the direct object of an *over-*prefixed verb both acts as the resultee and forms the comparison class for the scale measuring the extent of the result state. The direct object of the *out-*prefixed verbs is not entering any new result state, but forms the comparison class as the specifier of the scale measuring the extent (time or quality) of the process.

The scale typology forms the basis for prefix selection, where the prefix may only combine with a verb if it provides a monotonic upper open scale. Thus both interpretation and acceptability of verb-prefix combinations are derived from structure.

1. Introduction

I compare the contrasting syntactic behaviour of the English verbal prefixes *out-* and *over-* and illustrate how the semantic and combinatorial properties of a prefix can be derived from the different syntactic positions. Both *out-* and *over-* prefixes modify an event specifying its extent as exceeding a certain standard along a scale related to the verb, but in case of *out-* the reference point is provided by another performance of the same event, while in case of *over-* the reference is a functional standard on a scale of change. Thus, (1-a) is acceptable with the meaning that the subject estimated the poll results better than his competitor did. In (1-b) the functional standard is the actual state of affairs pertaining to the direct object, such that the estimation exceeds it.

- (1) a. He outestimated his closest competitor [google news].
- b. He overestimated his closest competitor.

The question arises, why in (1-a) the DP ‘his closest competitor’, which is syntactically a direct object, is interpreted as an agent of an implicit event, while in (1-b) the direct object is interpreted as the object estimated. The direct objects have entirely different roles, though the syntactic structure looks identical on the surface. Thus (1-a) cannot be interpreted as a degree of estimation of the competitor, while (1-b) cannot be interpreted as a comparison between two estimations, one by the subject and the other by the competitor.

The contrast is reminiscent of the contrast between adjective comparison classes suggested by Toledo and Sassoon (2011) involving within-individual-comparison or between-individual-comparison. The over-estimating case has more to do with within-individual comparison (the degree to which x estimates y exceeds another, more accurate, degree of x estimating y), whereas the out-estimating case has more to do with between-individual comparison (the degree of x estimating y exceeds the degree of z estimating y).¹

I suggest that the comparison scale is introduced in syntax as a separate ‘ScaleP’, which uniformly appears as the complement of the prefix. The phrase is headed by a Scale head, which creates a scale based on a contextually relevant quality of the event variable in its complement, which is closed by the closest event head (result or process). The scale picks up the relevant quality of the event based on context and on the nature of the event, e.g. the accurateness of the result of estimation in (1-b), or general successfulness of the estimation process (a series of estimations) in (1-a). The specifier of the ScaleP provides the basis of the comparison class formation. The fact that the DP originates in the ScaleP specifier position, rather than a verbal argument position, accounts for unselected objects (e.g. the contrast between ‘to overestimate the competitor’ vs. ‘*to estimate the competitor’). Thus, while the object of the verb ‘to estimate’ is a certain value (‘to estimate the cost’), it is possible to ‘overestimate’ an object, meaning to estimate the value of the object inaccurately. Substituting the value with the object is possible because the Scale function creates an ordered set of possible results of estimation of the value of the object in its specifier.

¹Thanks to an anonymous WAASAP reviewer for pointing out the similarity

Following Configurational Theta assignment (Ramchand (2008), Borer (2005)), the specifier of the ScaleP may move up to the object position where it receives an additional theta role as the holder of the result state. Thus in (1-b), ‘the competitor’ is in the specifier of the ScaleP, but in addition moves up to the resP, where it receives the resultee theta role. As in this case a change of state is obligatorily involved, the result state of the resultee is compared to the specifier of ScaleP along the contextual scale of change, and since the comparison class is coindexed with the resultee, within-individual comparison is ensured. The end state of the resultee is compared to its own standard value.

This contrasts with (1-a), where the DP ‘the closest competitor’ is the specifier of the ScaleP, and forms the comparison class, so that the competitor’s performance is exceeded. ‘The closest competitor’ is not undergoing any change as a result of being out-estimated, so in this case the DP does not acquire additional patient theta roles. As there is no change involved, two performances of the event are compared, and as the ScaleP specifier is distinct from the subject, between-individual-comparison is ensured.

Hence, though in both cases in (1) the DP ‘his closest competitor’ is in the specifier of the ScaleP, there is a striking contrast between the active role of ‘the competitor’ in (1-a) and the ‘patient’ role in (1-b) where ‘the competitor’ can only be the object estimated rather than performing any estimations. I argue that this contrast follows from the different position of the prefix in the syntactic structure. Based on the tripartite event decomposition suggested by Ramchand (2008) into initiation, process and result, I argue that the different interpretations of the prefixes arises from their different positions in this structure: *out-* measures out the process subevent, while *over-* measures out the result state. In (1-a) the prefix combines with the process head, and the scale is consequently identified with the process (of estimation). The specifier of the scaleP then mirrors the role of the specifier of the procP, which is coindexed with the specifier of initP for verbs that accept out-prefixation. This ensures the agent role of the specifier of the scaleP in this case, so the specifier of scaleP is the subject, and the scale measures how well he performs the estimations. On the other hand, in (1-b) the prefix combines with the result head, thus the scale is identified with

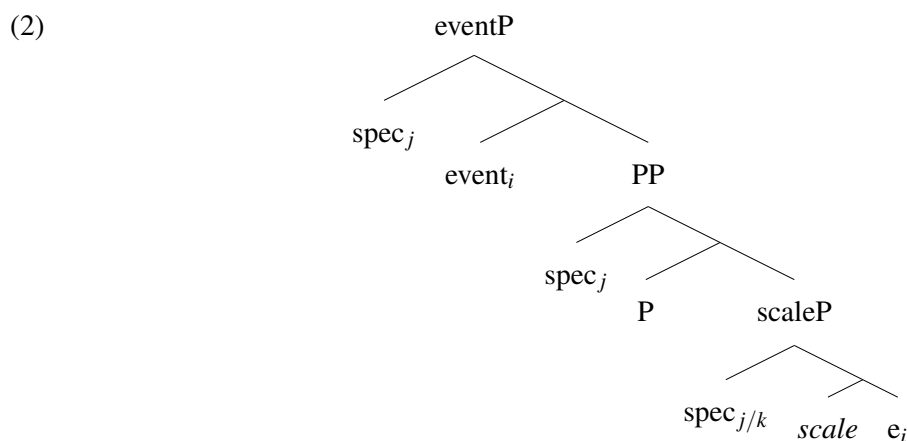
the extent of the result state, and its specifier has to be interpreted as the holder of the result state rather than a participant of the process. The result state in (1-b) corresponds to the accurateness of the estimation and the resultee is the object estimated, thus the comparison class in this case is determined by the direct object rather than the subject.

In the next section I describe the conceptual meaning introduced by P and show how the different interpretations are derived from it. The third section is dedicated to scale classification that forms the basis for prefix selection. The fourth section presents the evidence for the syntactic structure, where *out-* is located in *procP*, while *over-* is located in *resP*. Section five derives selectional restrictions from syntactic structure and scale classification.

2. Conceptual entry

It has been argued that the P elements have some similar structural properties, whether used as prepositions, particles or prefixes (Asbury et al. (2006), Matushansky (2002), Zeller (2001), Pantcheva (2007)), Svenonius (2004), Gehrke (2008)). Accordingly, I suggest that in every use the P element heads a PP, with a scaleP (of which path is a subclass) as a possible complement, and the PP is a complement to an event-head: *result* or *process* projection.

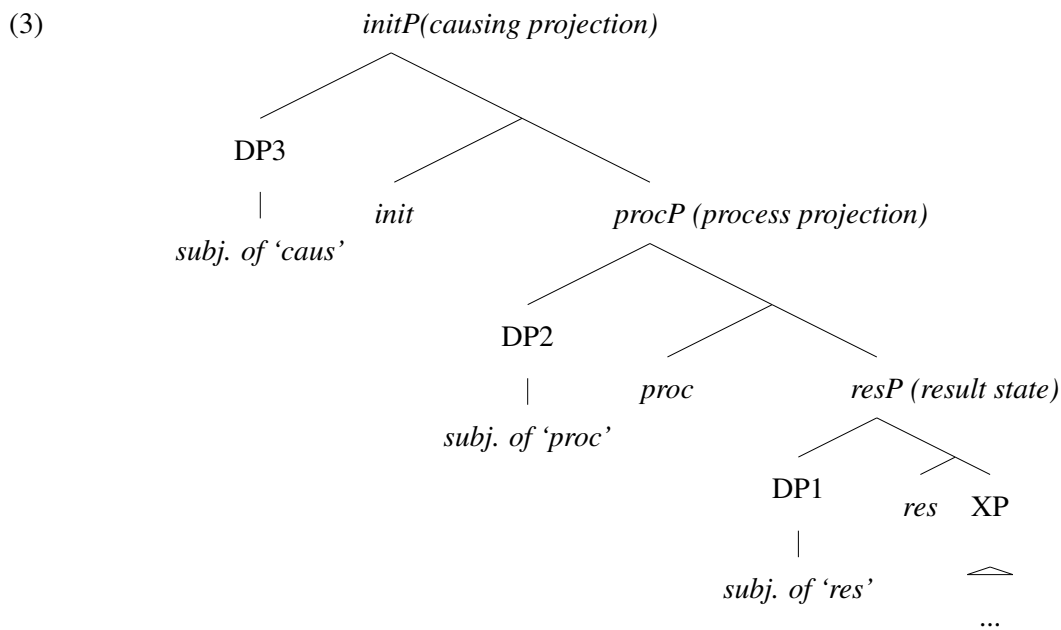
Thus, the generic structure looks as follows:



The scale head creates a scale, i.e. a set of values associated to the event variable, which is closed at the event phrase. This ensures that the scale for ‘out-dance’ is associated with dancing, i.e. is

a set of evaluations of the contextually relevant quality of the dance event. The specifier of the ScaleP may be coindexed to the specifier of the event (within individual comparison) or distinct (between individual comparison). The specifier of the PP coincides with the specifier of the event phrase dominating it, i.e. the undergoer or the resultee is also the specifier of the PP.

While the structures entered by prefixes look similar, they are far from identical. The source of variation is First Phase Syntax event decomposition suggested by Ramchand (2008), where an event may contain initiation, process and result subevents. Such decomposition is governed by the Principle of Event Composition, where initiation leads to process and process potentially leads to a result state. Each of these subevents, when present, is represented as its own projection, ordered in the hierarchical embedding relation as shown below in (3).



2.1 Out

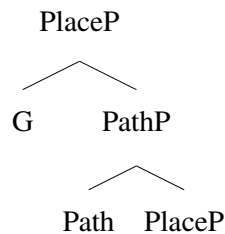
A P-element may then attach at different levels. If P is a preposition, it can appear in the complement of *res*, according to Ramchand (2008), thus *res* is the relevant event-head, while the path out of the window provides the scale. Since *res* is a state, because of the homomorphism requirement (Ramchand, 2008) it can only be mapped to the final point of the scale, rather than the entire scale,

as in the case of processes. Then the result state of the garbage is at the end of the path out of the window. The same mechanism is used for static place readings of path prepositions, as in (4), where a goal PP denotes the location at the end of the path:

- (4) Across a meadow a band is playing excerpts from H.M.S. Pinafore. (Cresswell, 1978)

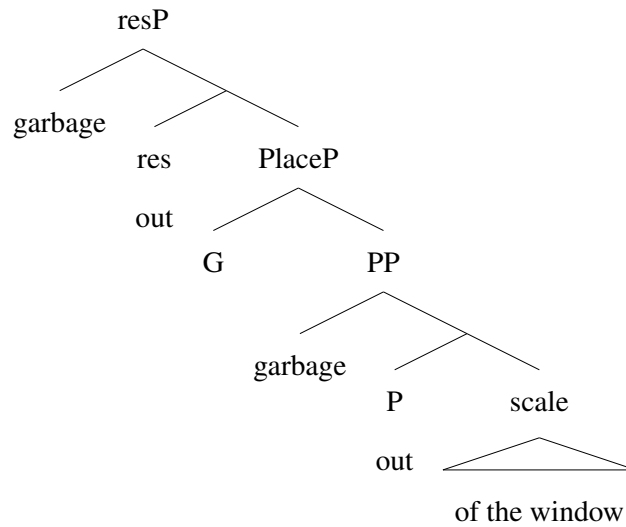
For such structures Svenonius (2010) argues, building on Cresswell's (1978), for a G-head above PathP hosting Path-to-Place G function, which handles the natural locative interpretation of *across* in (4), paraphrased as 'at the end of a journey across the meadow.'

- (5)



Thus, the result state of the throwing event in (6) is mapped to the 'G-location' at the end of the journey out of the window.

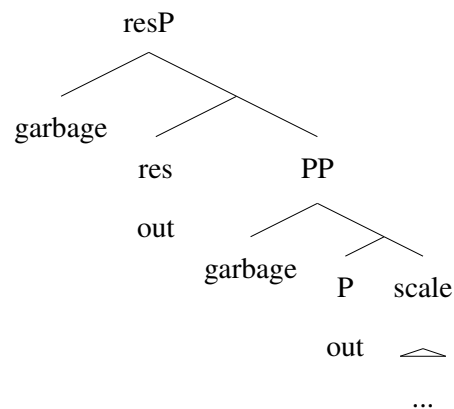
- (6) 'to throw the garbage out of the window'



‘Garbage’ in (6) gets three theta roles: (i) the undergoer of the throwing process, (ii) the resultee, i.e. the holder of the result state of being thrown out, and (iii) the subject of the PP, i.e. the figure moving along the trajectory described by the P.

The ground can be left implicit, as in the case of particles:

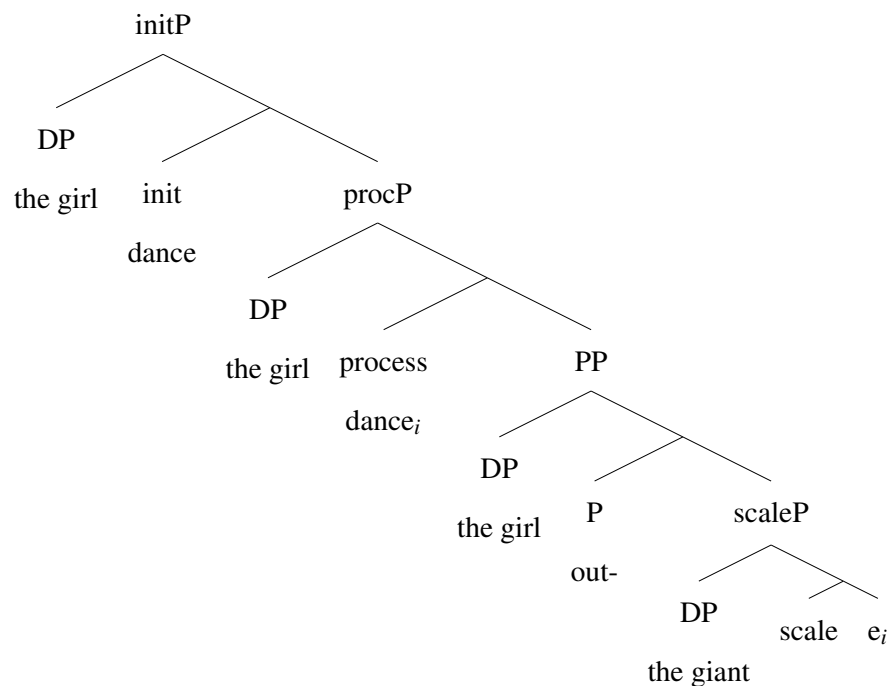
(7) ‘to throw the garbage out’



As for the prefix, it also appears between the eventive process head and an unpronounced scale. The scale in (8) is associated with the verb ‘to dance,’ and may measure quality or quantity of dancing, depending on the context. In this case the scale is the complement to process, rather than to result state, and the process can be homomorphically mapped to the scale. The giant’s

performance along the scale related to the dance (e.g. quality or quantity of the dance depending on the subject of the context) takes up a part of the scale along which the event of the girl's dance evaluation is mapped. Thus, the event 'the girl danced' is mapped along the scale of dancing, and ends **out** of the range corresponding to the giant's performance.

(8) The girl outdanced the giant.



The scaleP with the DP 'giant' in the specifier creates a scale, which is an ordered set of measurements of an event variable. The P head creates a directed path oriented 'out' of the range of values corresponding to the giant's performance along the dance scale. This scale is similar in shape to the path out of the window, as both are an ordered set of values directed out of the ground. The process event is mapped to the path in the PP.

1. ScaleP: $\lambda x, e. \text{Scale}(x) \ \& \ \text{bounded}(x, f(\text{giant})) \ \& \ R_{\text{characterize}}(x, e)$
2. PP: $\lambda p, e \exists x. \text{Path}(p) \ \& \ \text{figure}(\text{the girl}, p) \ \& \ R_{\text{orientation}}(p, x) \ \& \ \text{Scale}(x) \ \& \ \text{bounded}(x, f(\text{giant})) \ \& \ R_{\text{characterize}}(x, e)$

3. $\text{procP: } \lambda e \exists p. \text{process}(e) \ \& \ \text{undergoer}(\text{the girl}, e) \ \& \ \text{R}_{\text{homomorphism}}(e, p) \ \& \ \text{Path}(p) \ \& \ \text{figure}(\text{the girl}, p) \ \& \ \text{R}_{\text{orientation}}(p, x) \ \& \ \text{Scale}(x) \ \& \ \text{bounded}(x, f(\text{giant})) \ \& \ \text{R}_{\text{characterize}}(x, e)$
4. $\text{initP: } \lambda e' \exists E. \text{Init}(e') \ \& \ \text{initiator}(\text{the girl}, e') \ \& \ e' \rightarrow e \ \& \ \text{process}(e) \ \& \ \text{undergoer}(\text{the girl}, e) \ \& \ \text{R}_{\text{homomorphism}}(e, p) \ \& \ \text{Path}(p) \ \& \ \text{figure}(\text{the girl}, p) \ \& \ \text{R}_{\text{orientation}}(p, x) \ \& \ \text{Scale}(x) \ \& \ \text{bounded}(x, f(\text{giant})) \ \& \ \text{R}_{\text{characterize}}(x, e)$

Formally, the scale phrase simply creates a scale related to the individual in the specifier. The relationship is rather flexible, as I discuss below, so it has to be determined pragmatically. The scaleP with the DP ‘giant’ in the specifier yields the subpart of the scale corresponding to the giant’s performance, which acts as the ground for the P head. The P head creates a directed path oriented ‘out’ of the range corresponding to the giant’s performance. This scale is similar in shape to the path out of the window in (6), as both are an ordered set of values starting inside the ground and ending outside it. The process event is mapped to the path in the PP.

The scale head takes an event variable as a complement and is a function that creates a scale, i.e. a set of values, related to the event. E.g. if the event is ‘dance’, a scale can be a set of dance lengths, or a set of possible scores at a dancing competition. If the event is a consumption verb such as ‘eat’ or ‘drink’, the scale is a set of volumes consumed, with creation verbs the scale is based on amount created.

This scale combines with the P head containing the prefix ‘out-’. The scale variable is existentially closed at this point, and the P head yields a path variable, which is a scale oriented out of the source, where the source is the giant’s performance. The specifier of the pathP, the girl, is the figure moving along the path, away from the ground. In this case, where the path is a directed scale of change, no literal movement in space is present. Yet, the relationship between figure and ground is very similar, since the figure obtains the values constituting the path, starting inside the ground, and ending outside. In the dynamic reading discussed above, when this oriented path combines with the process, a homomorphic relationship is established, where every subpart of the process is mapped to the corresponding subpart of the scale.

The figure of the PP, the girl, is also the specifier of the procP, and of the initP, as the subject of an intransitive verb like ‘to dance’ is both the initiator and the undergoer of the event.

The event variable is existentially closed at the procP level (pathP can only existentially close the scale variable, as it is not an eventive phrase), which ensures that the process and the event characterised by the scale are the same event.

The oriented path can combine with the process in two ways, either yielding a telic dynamic reading, or a static atelic one.

In this case the path is telic, and the process, through being mapped to a telic path, is also telic. The unprefix verb is atelic.

- (9) a. Mary ran out of the house in a minute.
 b. The girl out-danced the giant in an hour.
 c. *The girl danced/ran in an hour.

The telic event has a dynamic reading, where the girl danced until she managed to beat the giant. However, an atelic reading is possible, where the quality is evenly spread along the entire process, i.e. (10-a) means that the girl danced, and she was better than the giant for the entire hour of dancing.

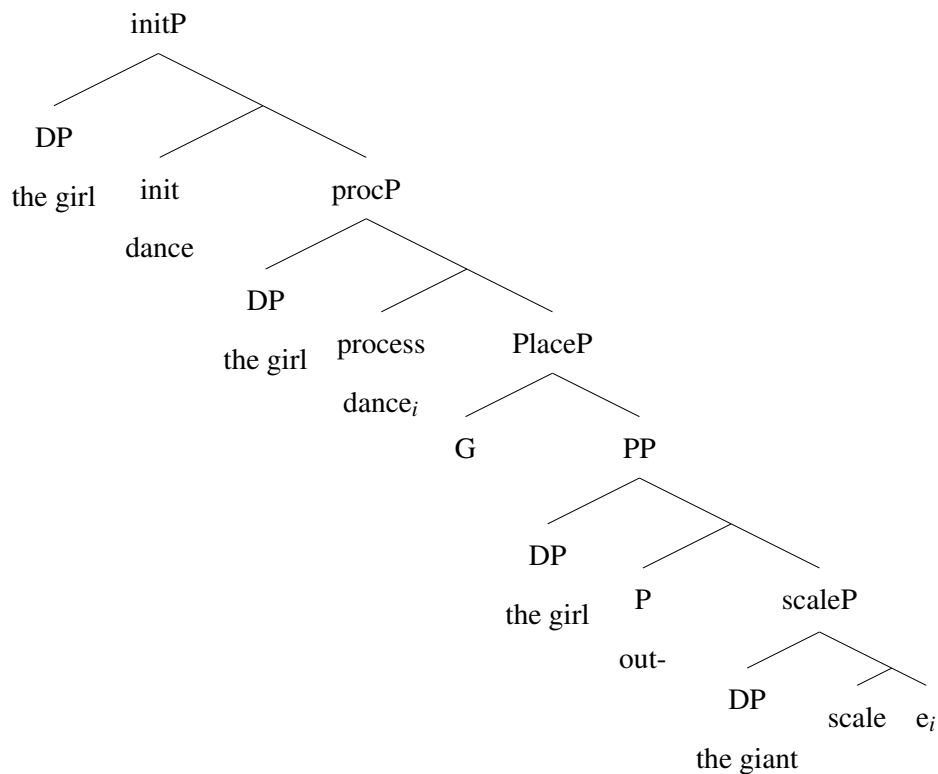
- (10) a. Mary out-danced the giant for an hour.
 b. I think the Pacers outplayed Miami for most of the game. (google)

In principle, there is no requirement that the scale must measure out the process duration. Thus for static verbs, where duration cannot be measured, the scale picks out the pragmatically relevant property, such as the weight in (11-a) or shelf life in (11-b).

- (11) a. The moose outweighs the polar bear.
 b. Orange juice outlasts milk.

In this case no homomorphic mapping is possible between the process and its constant value on the scale, so the relationship holds between the process and a single value along the scale (the final value of the path, which is outside of the scale-subpart characterizing the direct object).

A path-to-place function that extracts the final location of a path is independently needed for cases where a path combines with *res*, as we saw in (4), where result state was mapped to the G location.



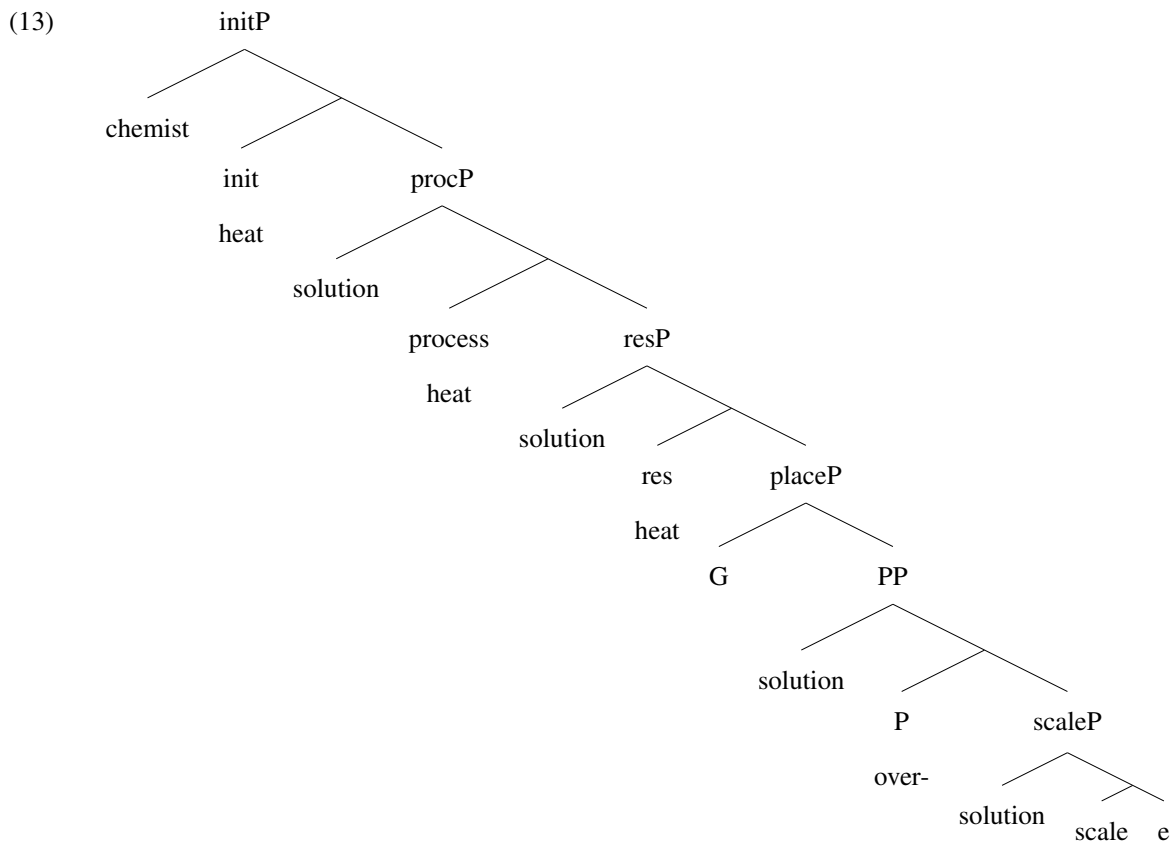
Thus, in a static reading of *out*-prefixed verbs, a path-to-place function combines with scalar paths and returns the goal-state at the end of the path, i.e. the entire process is estimated as out of the limits, i.e. exceeding, the value assigned to the direct object along the same scale. This same function applies to the PP headed by *over*- in next section, which is the complement of the *resP*. Since *res* subevent is a state, it can only be mapped to the state at the end of the path.

2.2 *Over*

The prefix ‘over-’ is similar to ‘out-’, as both prefixes measure the extent of the event on a scale and it exceeds/is out of the limits of another value on the same scale. However, while in the case of *out-* the performance of the opponent provides a point of reference, in the case of *over-* the scale itself must contain a functional standard value, because the lexical entry for the prefix refers to it. Thus, in (1) ‘He overestimated his opponent’ the predicate ‘to estimate’ with the direct object ‘opponent’ provides a functional standard, which corresponds to the accurate degree of estimation of the opponent. If the subject estimates the opponent more than is accurate, the resulting assessment of the opponent falls outside of the values along the scale that correspond to an accurate estimation. Similarly, (12) does not mean that the chemist heated the solution more than someone else did, but that the temperature is higher than the contextually recoverable functional standard of the extent to which the solution should be heated.

(12) The chemist overheated the solution.

In this case the direct object ‘the solution’ is undergoing change, so it is both the undergoer and the holder of the result state, so (13) has also a resP below the procP.



The result state is mapped to a point on the corresponding extent scale that exceeds the functional standard. For example, if the predicate is ‘to overestimate’, the scale reflects how much the object is estimated, the specifier of the scale tells us that the estimation scale is related to the ‘competitor’. The functional standard is how much the competitor should be estimated, and if the extent of the result state extends further along the scale, the object was estimated too much. The specifier of the scale phrase moves up to the specifier of the result phrase position, and because the direct object is the resultee, i.e. the holder of the result state, we know it has a patient role, i.e. the candidate was overestimated rather than doing too much estimating, and the solution was heated too much, rather than heating something else too much. This contrast with the scale specifier in case of out-prefixation, which is coindexed with the undergoer position. As out-prefixation is only possible with intransitive verbs (or transitive verbs coerced into intransitive use, as discussed in section 5), the undergoer of the intransitive verb is coindexed with the initiator, i.e. undergoer of

an intransitive role has a subject role in the verbs that are compatible with out-prefixation.

Thus, both *out-* and *over-* as prefixes map an event onto a scale of change, ensuring that the event's extent is outside (for *out-*) or exceeds (for *over-*) a certain value, provided by the prefix complement.

3. Scale typology

Both prefixes under discussion map an event to a certain point on the scale, formed by degrees of a certain property related to the direct object. What this scale is and how it is formed is thus a crucial issue that must be established before we can continue with the discussion of prefix semantics and syntax. Context, as is well known in the semantics of adjectives, plays a crucial role in scale interpretation. Gradable adjectives are interpreted relative to a comparison class (Van Rooij (2011), Toledo and Sassoon (2011)), e.g. the vague adjective 'large' means 'larger than the comparison class', which gives different values for 'a large flea' and 'a large elephant'. According to Toledo and Sassoon (2011), it is the nature of the comparison class that constitutes the main semantic difference between their subclasses: absolute adjectives (full, flat, straight) select a class comprised of counterparts of the individual of which the adjective is predicated, while relative adjectives (large, tall, long) select an extensional category of this individual.

Like absolute adjectives, *over-* prefixation establishes a comparison with the counterparts of the individual of which the result state is predicated. For example, to know that a glass is full one needs to compare how full the glass is to other possible volumes of the same glass, and the volume has to be the maximal value for that particular glass. Similarly, to know that the event denoted by the phrase 'over-heat the solution' has occurred, one has to compare the state of the solution to other possible states of the same solution. On the other hand, *out-* prefixation needs the direct object to provide the comparison standard, in respect to which the performance of the subject is evaluated.

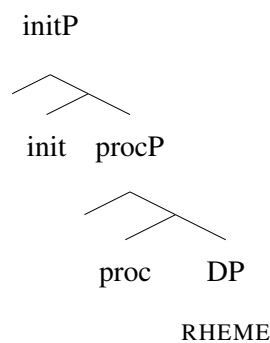
When a verb is derived from a 'between-individual comparison class' adjective, it does not preserve the comparison class of the adjective. For example, such verbs as *lengthen*, *shorten*, and *widen* mean to make the object longer, shorter or wider than it was before, not to make it

long/short/wide relative to a comparison standard, or longer/wider than other objects. Thus the difference between within individual (e.g. ‘straight’) and between individual (e.g. ‘long’) comparison classes is not preserved in de-adjectival verbs (except in passive, such as ‘lengthened’). Uniformally, the direct object of the verb provides the comparison standard (x becomes longer than x was).

Such is also the case with the prefixed verbs. If x is overheated, it becomes hotter than x should be. The object also provides the functional standard of out-prefixed verbs, with the crucial difference that it is not undergoing any change itself.

Thus, the scale is based on the verb, the direct object of the verb provides the point on the scale that serves as a comparison standard, and the prefix determines the relationship between the event and the comparison standard on the scale. The scale phrase, with the direct object in its specifier, appears in the complement of the prefix, and the entire prefix phrase is the complement of an event head: process or result in Ramchand’s (2008) terms. This position is where Ramchand (2008) introduces RHEMES, which, by definition, always occur in such complement positions. PATHS are described as a subclass of RHEMES. A Rheme PP or DP, unlike *resP* does not introduce a new subevent, but “acts as a further modifier or description of the *proc* event”, with which it combines by event identification.

(14)



The relationship between the process and Rheme is homomorphic, where the subevents of the process are mapped to the scale, e.g. in case of paths, “the path structure of the PP is mapped onto the temporal path structure of the time line of the event the two relations R and R’ would be spatial

ordering and temporal ordering respectively.”

(15) *Isomorphism:*

An isomorphism between two systems is a one-one correspondence between their elements and a one-one correspondence between their operations and relations which satisfies the following conditions: 1. If a relation R holds between two elements of A, the corresponding relation R' holds between the corresponding elements of B; if R does not hold between two elements of A, R' does not hold between the corresponding elements of B.

2. Whenever corresponding operations are performed on corresponding elements, the results are corresponding elements. Homomorphism is a correspondence with all the properties of an isomorphism except that the mapping from A to B may be many-to-one; the set B may be smaller than the set A. (Partee et al., 1990)

As state denoting subevents, initiation and result can be mapped only to states, and the complements of these heads are stative ((16-a,c)), while process is mapped to a dynamic scale or path, which may appear in its complement (16-b).

- (16) a. The cat is **on a mat / happy**
- b. Karena jogged **two miles / to the store**
- c. Karena entered **the room**

Thus the homomorphism requirement ensures that the complement of process is a dynamic scale, while the complement of the result projection is a state. The prefix *out-* combines with the RHEME, scaleP in the complement of process, and the subevents constituting the process are mapped to the

subparts of the scale.

PPs with ‘over’ can appear both in process and result themes. In (17-a,b) the PP denotes a place reached within a single jump and is the result complement, while in (17-c,d) the PP denotes the path along which Mary jumped and is the process complement.

- (17) a. Mary jumped over the creek.
b. Mary jumped into the lake. (Ramchand, 2008)
c. Mary jumped over the bridge.
d. Mary jumped towards the lake. (Ramchand, 2008)

While the preposition *over* combines with path PP, *over*-prefixation uses the scale lexicalized by the verb. E.g. if the main verb is ‘to heat’ the scale is the mapping of the subevents to the temperature measures. When *over*- combines with this scale it binds the scale, specifying that the final temperature is greater than the standard. A result subevent, by homomorphism cannot be mapped to the entire scale, but only to a point. Thus, instead of the set of relations in a process, a single relationship is established between the result event and a point exceeding the functional standard. This complex RHEME headed by the prefix combines with the result head by event identification.

The relation between the two domains (process and scale) preserves the ordering from one domain to the other, which corresponds to Schwarzschild’s 2002 definition of monotonicity.

To derive the ordering of the PATH, a function μ is introduced Ramchand (2008) (p.50), which gives measures of the property in question $\Pi_C(x)$ (related to the object, but determined by context), based on the part-whole relationships. E.g. for consumption verbs (e.g. ‘to drink beer’), if the object is beer, the property is volume, which is a monotonic property (a subpart of beer has a subpart of volume), and μ creates an ordered set of volume measures.

Thus, μ creates a scale: an ordered set D of values of a particular attribute, e.g. volume, temperature, amount of work done, or the distance travelled.

The PATH function maps an event to a scale, a prototypical subclass of which is a path. Events, as well as paths and scales in general, come in various shapes, hence the mapping can be differently

specified by prefixes. An event has, maximally, a beginning, some process duration and a result state, though not all of these subparts are necessarily specified. Similarly, a path has a starting point, some distance and the goal point, and a scale can have an initial state, an extent of change of state, and a result state. If both the event and the scale have all these subparts, and no prefixes further specify the mapping, it is natural to map the beginning of the event to the initial state, the subevents to subparts of the scale of change and the result state to the final point on the scale of change. However, P elements (prefixes and prepositions) serve to select the relevant subpart of the scale.

‘Out-’, for example, maps the process to the subpart of the scale in its complement that starts at a certain point, or, when used as a directional preposition, maps the process to the source path directed out of the starting point. ‘Over-’, on the other hand, maps the result state to a point on the scale of change beyond the functional standard.

3.1 *Scale and Path typology*

Both scales and paths can be classified according to their shapes, as they can be open or bound on one or both ends. Thus, the scale typology in (18), suggested by Kennedy and McNally (2005), closely mirrors the path typology suggested by Zwarts (2005).

- (18)
1. $\langle D_{(0,1)}, R, \Delta \rangle$ (TOTALLY) OPEN SCALE (#slightly, #perfectly tall)
 2. $\langle D_{[0,1)}, R, \Delta \rangle$ LOWER CLOSED SCALE (slightly, #perfectly dirty)
 3. $\langle D_{(0,1]}, R, \Delta \rangle$ UPPER CLOSED SCALE (#slightly, perfectly clean)
 4. $\langle D_{[0,1]}, R, \Delta \rangle$ (TOTALLY) CLOSED SCALE (slightly, perfectly full)

The evidence for this typology comes from the distribution of degree modifiers such as ‘slightly’ and ‘perfectly’, which pick up the minimum and maximum degree on the scale. Thus, lower closed scale adjectives, such as ‘dirty’, pick out a minimum on the scale, e.g. if the object is minimally dirty it is true that it is dirty. The upper closed scale adjectives, such as ‘clean’, pick out the maximum point on the scale, so the statement that something is clean is only true if the maximum

cleanness for that object is reached.

The algebra of paths suggested by Zwarts (2005) similarly allows to classify paths according to the boundedness of their endpoints.

(19)

		'at'	'in'	'on'	above	transition
source	p(0)	from	out of	off		+ –
goal	p(1)	to	into	onto		– +
route	p(i)	via, past	through	across, over	over	– + –

A goal preposition maps an event to the goal path in such a way that the relationship holds between the final subevent (e(1)) to the final point of the path (p(1)). E.g. the final subevent of the event 'walk to the store', at time 1 (where the event starts at time 0 and ends at time 1), is mapped to the final point of the path, p(1). Then the transition occurs from not being at the goal location (marked by minuses) to being at that location (marked by plusses). This contrasts with source prepositions, where the initial subevent e(1) is mapped to the beginning of the path p(0), and the transition is to not being there.

For the mapping to take place correctly, the path must have a beginning and an end. The same requirement holds for scales, which, as demonstrated in (18) come in different shapes. A source path is a sub case of a lower closed scale, as both have a minimum point, to which the initial subevent can be mapped, but both are open on the other end. A goal path is a subclass of an upper closed scale, as both have a maximal point.

Thus, as a source prefix, 'out' can only map the process to a lower closed scale. 'Over' can also map events to lower closed scales, as its main requirement is that the scale is open on the upper end, so both open scales and lower closed scales are acceptable, as long as they contain a standard of reference.

These different requirements on the scale type conspire with the contrasting syntactic positions to derive the distribution of the prefixes. In the next section I derive the syntactic positions of the prefixes and derive the contrast of object roles from the syntactic position of the prefixes.

4. Process vs. Result

In this section I present the evidence for locating ‘over-’ in the resP and ‘out-’ in the procP. The direct object of an over-prefixed verb clearly both undergoes a change of state and enters a distinct result state, as supported by tests suggested by Beavers and Koontz-Garboden (2012) in the next subsection. This contrasts with the direct object of out-prefixed verbs, which is not affected by the event.

‘The chemist overheated the solution’ entails that the chemist heated the solution, and change can be detected by checking the state of the solution after the event. ‘The girl out-danced the giant’ entails that the girl danced, but not that she did anything to the giant. Furthermore the truth of (20-b) cannot be confirmed by checking the state of the giant at a single point of time after the event, as opposed to (20-a).

- (20) a. The solution is overheated.
b. The giant is outdanced.

The entailment contrast suggests a difference in structure, as with an over-prefixed verb it is possible to negate the result without negating the process ‘heat the solution’ of which the direct object is a proper undergoer.

With over-prefixed verbs, it is possible to deny the result without denying the process. Thus (21-a) is compatible with readings where the chemist did or did not heat the solution: it is possible that he never even started heating, it is possible that the heating did not occur, and it is also possible that he heated the solution, but not to the point of excess. But while it is possible to deny the result without denying the process for over-prefixed verbs, such split is not available with out-prefixed verbs (21-b). While it is possible to heat the solution but not to overheat it, the phrase with the unprefix verb ‘dance the giant’ is ungrammatical. No process, of which the giant is an undergoer, exists in the absence of the prefix. This also holds of transitive verbs such as ‘scrub’ and ‘evaluate’.

- (21) a. The chemist did not overheat the solution, though he heated the solution.

- b. Cinderella did not outscrub her sisters, # though she scrubbed her sisters.
- c. The girl did not outdance the giant, *though she danced the giant.
- d. He did not out-evaluate his opponent, * though he evaluated his opponent.

Similarly, the ‘almost’ ambiguity test suggested by Dowty (1979) to distinguish the subevents, demonstrates a contrast. According to Dowty (1979), (22) has three meanings:

- (22) John almost killed Harry.
- a. What John almost did was kill Harry.
 - b. What John did was almost kill Harry.
 - c. What John did to Harry was almost kill him

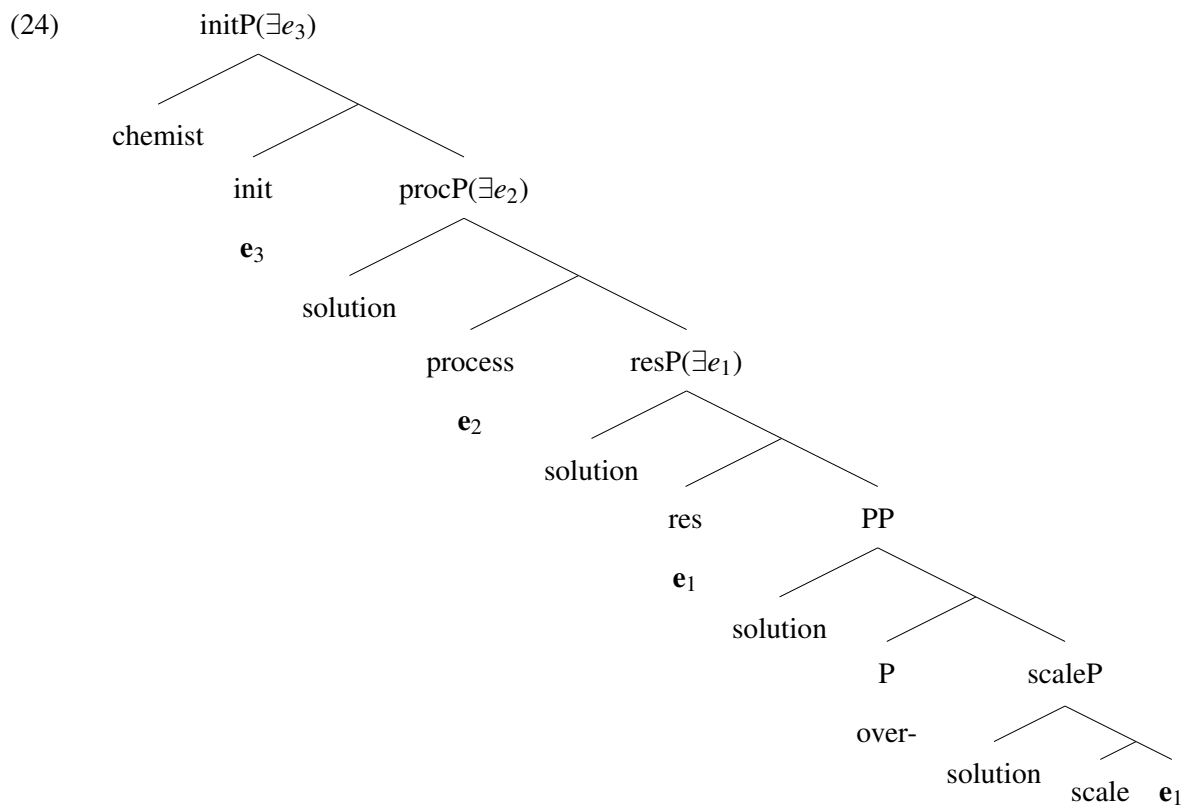
Here ‘almost’ can refer to incompleteness of different subevents: either John almost did something that would kill Harry, or he started the process of killing which did not reach its natural endpoint, or he (completely) performed some actions, the result of which is Harry’s almost dead state. This corresponds to ‘ALMOST DO’, ‘ALMOST CAUSE’ and ‘ALMOST BECOME’ in Dowty’s decomposition.

As the difference between the (22-b) and (22-c) is not always obvious, we’ll concentrate on the difference between the first two interpretations.

For example, (23) can have at least two meanings. Either John almost started the process of overheating the solution, e.g. almost pressed the wrong button but stopped on time and did not start heating the solution at all. Or he actually heated the solution, approached the point where it would be overheated and stopped there.

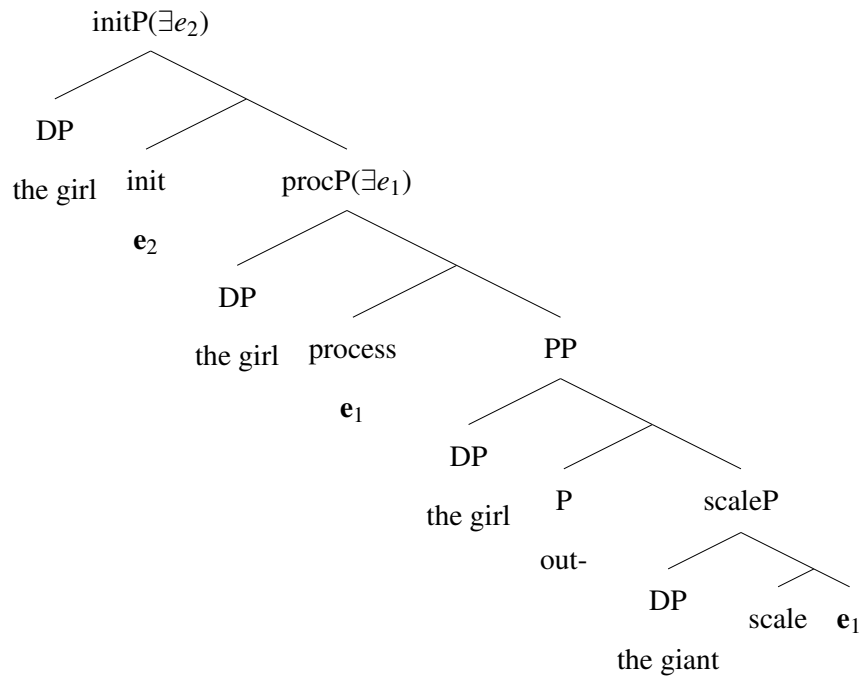
- (23) ‘John almost overheated the solution’ :
- a. What John almost did was overheat the solution.
 - b. What John did was almost overheat the solution.

This contrasts with out-prefixation: ‘the girl almost out-danced the giant’ cannot mean that the girl almost entered the contest where she was certain to win, but only that the girl danced almost long enough to beat the giant. ‘Almost’ can only refer to the incompleteness of the ‘out-dancing’ process, because there is no result state. This follows from the structural configuration, where over-prefixed verbs are more complex and two distinct events can be modified with almost. In (24) the structure of (23) is repeated (same as in (9)), and we see that both *procP* and *resP* contain an event, e_2 and e_1 respectively. The process, e_2 corresponds to heating, and the result e_1 corresponds to over-heating.



This contrast with the structure of ‘the girl out-danced the giant’ in (25) (same as (7)). In this case the same event appears the complement of the scale and the *proc*, which is existentially closed in the *ProcP*. Only this event e_1 can be modified with ‘almost’.

(25)



Hence there are no separate subevents, such as dancing process and out-dancing result, and no ambiguity.

4.1 Result Diagnostics

The syntactic contrast between the two prefixes is supported by the result vs. manner diagnostics used by Beavers and Koontz-Garboden (2012). If the event contains a result, the resultee is in a different state at the end of the event than in the beginning.

Therefore, according to Beavers and Koontz-Garboden (2012) it should be contradictory to follow any predicate headed by a result verb with denying that the patient has undergone a change in some property. Thus, one test is to see if denial of change of state is possible, as shown with uncontroversial result verbs in (26).

- (26)
- a. #Shane just broke the vase, but nothing is different about it.
 - b. #Shane just shattered the bottle, but nothing is different about it.
 - c. #Shane just destroyed his house, but nothing is different about it

By contrast, prototypical manner verbs fail to generate a contradiction with continuations that deny a result (27). For example, Levin and Rappaport (1998, p. 101) remark that none of the surface contact verbs (*rub, sweep, wipe*) entails a resulting change in the contacted surface. Thus, “although a hearer will infer that a swept floor is a clean floor because the conventional goal of sweeping is to clean a floor, there is nothing contradictory in saying *Tracy just swept the floor, but there are still crumbs on it.*”

- (27) a. Tracy just swept the floor, but nothing is different about it.
 b. Tracy just wiped the floor, but nothing is different about it

Turning to the prefixed verbs, we observe a contrasting behaviour with regard to this test: *over-*, unsurprisingly, entails change and is incompatible with denial of result (28).

- (28) a. Cinderella scraped / scrubbed the floor, but nothing is different about it.
 b. #Cinderella overscraped / overscrubbed the floor, but nothing is different about it.

On the contrary, the direct object of *out-* prefixed verbs is not expected to undergo any change, so the sentences in (29) are not contradictory.

- (29) a. The girl outdanced the giant, but nothing is different about him.
 b. The girl outdrank John, but nothing is different about him.

Thus, an excessive change of state, designated by *over-*, entails a change of state which cannot be negated without a contradiction, while a comparison between the extents of processes does not necessarily entail any resulting change.

The presence of the result projection with *over-* prefixation is also supported by ungrammaticality of object deletion. The transitive manner verbs, but not transitive result verbs, permit their objects to be omitted in certain contexts. If the result subevent is present, the argument of the subevent must be overtly realised. Conversely, since transitive manner verbs do not encode change of state,

there is no additional result subevent, and the object may be deleted. Rappaport Hovav (2008, p. 24) proposes that scalar change verbs disallow object deletion since “scales require that the participant whose property is measured out by them is overtly realised.” As Beavers and Koontz-Garboden (2012) suggest, this condition may follow from Rappaport Hovav and Levin’s (2001, p. 779) Argument-per-Subevent Condition, whereby there must be at least one overt argument for each distinct subevent in the verb’s event structure. If scalar change involves a change-of-state (BECOME) subevent of which the patient is the sole participant, then it must be realized.

Thus, manner verbs such as *scrub* may appear intransitively, giving rise to an existentially bound reading for the patient, which is disallowed for result verbs.

- (30) a. *All last night, Kim broke/ destroyed / shattered.
 b. All last night, Kim scrubbed.

Similarly, *over-* prefixed verbs do not allow object deletion, even if such deletion is possible when unprefixated.

- (31) a. All last night, Kim scrubbed.
 b. *All last night, Kim overscrubbed.

This direct object of *out-* prefixed verbs is clearly different semantically from the direct object of *over-* prefixation, which looks like a real resultee, i.e. undergoes change and enters a new result state.

In (32) the object that undergoes change (the object scrubbed) is deleted obligatorily and recoverable from context. ‘To scrub’ is a manner verb by all diagnostics, and *out-* only attaches to manner verbs that allow the direct object to be omitted to create room for the unselected object of *out-* prefixation. But the direct object of *out-* prefixation, which corresponds to the competitor, cannot be deleted ((32-b))

- (32) a. Cinderella out-scrubbed her sisters.

- b. *All last night Cinderella outscrubbed / outdanced / outperformed.

Yet, the impossibility of object deletion in this case should not be taken as evidence that *out-* adds a result projection to the manner verbs it attaches to. The obligatoriness of the direct object in (32) can be explained not by resultativity, but by the prefix interpretation. *Out-* requires a reference point on the scale, which the direct object provides. If we acknowledge Rappaport Hovav's (2008) claim that "scales require that the participant whose property is measured out by them is overtly realised", the obligatoriness of the direct object of *out-* prefixation is predicted. For *out-* prefixation to be interpretable, two scales are needed, though these scales do not measure a change of property, but rather quantity or quality of the process. Thus, there are two scales, and two events compared, and each needs an overt argument. So, if 'Cinderella outscrubbed her stepsisters,' Cinderella is the participant whose performance is measured by the first scale, while her stepsisters are the second participant, whose performance is measured by the second scale, which is coindexed to the same main verb. Yet, there is no result subevent, so the resultee participant may (and, actually, must) be omitted.

- (33) *Cinderella out-scrubbed her sisters the floor.

Because the prefix *out-* invokes the quality/quantity of a repetitive reading, (34-a) sounds better than (34-b). In the first case, the estimation quality/quantity provides two scales, along which the two performances are compared, while in the second case 'to estimate' lexicalizes a scale of the value assigned to a direct object, thus the argument, as the participant whose property is measured out along the scale, cannot be omitted.

- (34) a. He out-estimated his competitor.
 b. *All last night he estimated.

To sum up, in this section I arrive at the conclusion that *out-* is in *proc* and incompatible with result, *over-* is in *res* and requires the result, and the striking contrast in object interpretation is

derived from the different syntactic configurations. The direct object of *out*-prefixed verbs is the specifier of the PP in the complement of *proc*, and moves to the undergoer position, while the direct object of *over*-prefixed verbs is in the resultee position. The relationship between the *scaleP* and its specifier mirrors the relationship between the event head and its specifier, hence the *scaleP* in the *resP* measures the extent of the result state and its specifier corresponds to the resultee, while the *scaleP* in the *procP* measures the process quality/quantity and its specifier has the same role as the undergoer/resultee subject of the main verb.

In the next section I discuss the selectional restrictions imposed on the verbs and show that they are also predictable based on the syntactic structure.

5. Selectional restrictions

As we saw in the previous section, not every verb may combine with every prefix. The presence of a result projection was shown to be a crucial piece of the puzzle, however, it is not correct to reduce the selection process to a simple statement that *out*- combines with any verb that does not contain a result projection, while *over*- combines with every verb that does. An intransitive verb can be made transitive and resultative by prefixation, e.g. ‘*overwork*’ in (35-a) and resultative verbs can be stripped of their result projection to combine with *out*- under an atelic reading (35-b). Thus, a simple cut along telicity, resultativity, or transitivity lines does not give an accurate prediction.

- (35) a. The private universities were overworking the academic staff. (google)
 b. Each one would put up money that their division would **outload** the other one for those particular shifts, or that particular day. (COCA)

Nor does the division coincide with Vendler’s classes. In (35-b) and (36) we see that some accomplishments are compatible with both prefixes, though *out*- prefixation with accomplishments is somewhat exceptional, and only possible under a repetitive reading, where the accomplishment is coerced into an atelic activity. With *over*, on the other hand, a single telic event occurs.

- (36) They allowed him to overload the vehicle, thereby causing the accident. [COCA]

Yet, the acceptability of *over* prefixation sometimes seems to depend on the kind of object:

- (37) a. to overdry hair / skin / herbs
b. #to overdry glasses / towels

Furthermore, in some pairs such as *open-close*, *fill-empty*, *bend-straighten* only one verb is possible. In the next section I show how this contrast is derived from scale typology, where *open*, *bend* are lower closed scale verbs, while *close*, *flatten*, *straighten* are upper closed scale verbs.

- (38) a. Don't overopen your eyes when posing for photos! (google)
b. *Don't overclose your eyes!
c. Don't overfill the glass.
d. *Don't overempty the glass.

Most of these are unacceptable with *out-* prefixation, available only under a coerced atelic repetitive reading.

- (39) a. My doorman ? out-opens / ? out-closes all the doormen in town.
b. Robot Bender will ? out-flatten / ? out-straighten all the robots at the robot Olympics.

Furthermore, consumption verbs are only acceptable in intransitive form.

- (40) a. He overeats (on apples) / *apple
b. He can outeat anybody.

Achievements are unacceptable when punctual:

- (41) a. ??Kim outdestroyed the experienced wrecking crew. (Beavers and Koontz-Garboden, 2012)
b. *Romans overdestroyed Carthage.

- c. ?My executioner can out-hang your executioner's sorry ass any day. (Beavers and Koontz-Garboden, 2012)
- d. *The executioner should take care not to overhang the criminals.

However, degree achievements are possible with both prefixes, as we saw in the previous section.

- (42) a. Do not overcool or overheat the rooms!
- b. My little heater will outperform, outheat, and out-economize any infrared heater.
- c. Cinderella outscrubbed her stepsisters.
- d. Be careful not to overscrub the floor!

And activities are ungrammatical with *over-*:

- (43) a. *John overwatched TV.
- b. *John has overbeaten Mary.

The use of 'to beat' in (43-b) should be differentiated from the culinary meaning, in which case *over-* is acceptable, and a change of state is encoded, such that the object (e.g. cream or batter) gradually becomes more beaten until the right consistency is reached.

- (44) Do not overbeat batter, as it will result in a dense, heavy cake.

Similarly, activities that do not denote any change are unacceptable with *out-*.

- (45) a. #John out-watched Mary.
- b. #John has out-beaten Mary.

Yet, activities in a competition scenario may be acceptable, where a temporal or an evaluation scale is introduced.

The subject also plays an important role, as with the verb ‘to cut’, which appears as an intransitive activity with a knife as a subject, and describes the knife’s quality, while with an animate subject the verb is more naturally interpreted as a transitive achievement verb, which is incompatible with out-prefixation.

- (46) a. Ceramic knives can out-cut your average steel knife.
 b. ??This cook can out-cut any cook in town.

An activity may even be derived from nouns or personal names:

- (47) Bob out-Chomskyed Chomsky. (Irube, 1984)

In this case Chomsky also has to be understood ‘to chomsky’ in such a way that either a temporal or an extent scale of chomskying is easily recoverable from context.

Beavers (2011) suggests a classification of verbs based on an affectedness hierarchy illustrated in (48), where the direct object is most affected if the verb lexicalizes a quantized scale (and is then telic). The degree of affectedness decreases for non-quantized scales, where the verb is atelic, but the object is still obligatory and change cannot be denied. Potential, followed by unspecified, results are at the bottom of the affectedness scale. The potential/unspecified classes on the bottom of the table (48) with lowest relative transitivity disallow prefixation. Some activities are compatible with out-prefixation in a competition context, but the competition context then introduces a scale, e.g. if the activity consists of a repetitive interpretation of a verb, the amount of iterations increases with each iteration thus providing a proper scale based on the number of iterations. Such a scale does not normally have a functional standard, hence *over-* is dispreferred. Exceptions are possible when context provides as functional standard, as discussed in section 5.3. Both prefixes need a scale of change, which the verbs with unspecified or potential change do not provide. Thus, the lowest row of the table below is ruled out, as seen by the shading. On the upper half of the table, however, we see a split. The verbs with simplex scales, denoting a punctual event, are incompat-

ible with the prefixes that make reference to scale subparts, thus all the simplex scale verbs are ruled out for both prefixes. Complex non-quantised scales are compatible with prefixation, as they offer an open scale of change. However, the accomplishments do not form a homogenous class, as shown by a lighter shade of grey.

(48) The Interaction of Affectedness and Durativity/Punctuality (based on Beavers (2009))

	simplex scale (and/or event) no prefixation	complex scale (and/or event)
quantized	ACHIEVEMENTS <i>break a vase, kill Bill</i>	ACCOMPLISHMENTS <i>load the wagon, eat the apple</i> split prefix distribution
non-quantized	N/A	DEGREE ACHIEVEMENTS <i>cool the soup</i> over-, out-
potential / unspecified	SEMELFACTIVES <i>hit (once), cough (once)</i>	ACTIVITIES <i>beat, watch TV</i> *over-, ?out-

The compatibility of prefixes with the verbs of quantized scales depends on which end of the scale is quantized, and by what, as we see in section 4.2, but first let us turn to telicity and its role in prefix selection.

5.1 Telicity and monotonicity

In the previous subsection it was shown that prefixation is ruled out with simplex scales and far less acceptable with telic verbs than with atelic verbs encoding a complex scale of change. This restriction follows from my central hypothesis that the complement of the prefix always is (or can be reinterpreted as) a scale, where a scale is, according to Rappaport Hovav (2008) ‘an ordered set of values for a particular attribute’.

When an event interacts with an ordered set of values, we are actually dealing with a map-

ping relationship between two orderings: an ordering (usually temporal, but not necessarily, as shown in Gawron (2009)) of the subevents of the main event and with the ordered values along the scale of change. If the attribute is monotonic on the event's part-whole relations, then less of the event means less of the attribute, and the more the event goes on, the higher is the value of the attribute. This follows from Schwarzschild's (2006) definition of monotonicity through reflecting part-whole relationships. For example, if there is a pile of cherries of a certain weight, the weight is a monotonic property: if some cherries are taken away, the weight goes down, if some cherries are added, the weight goes up. By contrast, the amount of cherries has no such effect on their colour or temperature. When one ordering tracks another ordering, it is said to be monotonic on that ordering. For example, volume and weight are monotonic on the relevant part-whole relations. However, temperature and colour are not monotonic on those part-whole relations.

Now, consider the relationship between the event and scale introduced by *out* in (49):

(49) The girl outdanced the giant.

The relevant event is 'girl danced'. The relevant scale is also provided by the verb 'to dance', as the prefix compares two values on a scale associated with dancing, established by the two performances. 'To dance' is an atelic verb, so if the event is a dancing event, its subintervals (provided they are not too small) are also dancing events. Thus, these subevents can be ordered, as a part whole relationship. Thus, the values on the scale associated with dancing are monotonic on the part whole relations of the dancing event. As the dancing event provides a monotonic scale, the comparison of two values on the scale is possible, and the prefix is interpretable. Thus, a monotonic event, a subinterval of which is 'less of the same event', i.e. an atelic event, may provide a scale, measurable by a prefix.

The scale does not have to be exclusively temporal, as it is possible to out-dance in terms of quality, even if the winning dance is shorter. Still, the estimations of quality of dancing can be positioned on a scale: if the dancer's performance deserves, say, a grade 7 at a dancing competition, it entails that she danced well enough to deserve 6, 5, 4, etc., but not vice versa. The quality

estimations may also be ordered in terms of part-whole relationships.

Events are not mapped exclusively to temporal scales (Gawron, 2009):

- (50) a. The crack widened (from the north tower to the gate.)
 b. Snow covered the mountain (from the valley floor to the summit).

Gawron (2009) calls the verbs that allow both an event and an extent reading two-dimensional. In the eventive reading, movement is entailed, while in the extent reading, the spatial axes provide the dimension. Thus, we observe the interaction of three scales: temporal, spatial, and extent. In the eventive reading movement is implied, so the verbs are similar to regular motion verbs: widening is happening in time along the path from the north tower to the gate. At every subsequent moment, the crack has widened at the subsequent location, thus a mapping is established between time and space. In the static reading, on the other hand, the temporal scale does not enter the picture. A certain, increasing, width, corresponds to every location on the spatial axes from the north tower to the gate.

Similarly, (49) can have a dynamic or an extent reading. Under the first, the girl dances more than the giant, so the temporal scale of the girl's dancing is compared to the temporal scale of the giant's dancing, and the girl's dance progresses longer than the giant's. Under the second reading, the comparison is possible in a single slice of time, along the extent scale, so that the mapping occurs between the two quality scales.

A telic event does not necessarily provide a monotonic scale. For example, it is not true that a subpart of a destroying event is also a destroying event. Thus, there are no multiple 'destroy' subevents to order, and no scale may be formed. As no scale is formed, it is not possible to assign values to events along it and to interpret the prefix as a relationship mapping the event to the scale. This is why the prefixes *out-* and *over-* are incompatible with the telic achievement verbs, as we saw in (88), repeated below:

- (51) a. ??Kim outdestroyed the experienced wrecking crew. (Beavers and Koontz-Garboden,

2012)

- b. *Romans overdestroyed Carthage.

As a telic verb, ‘to destroy’ does not provide a monotonic temporal scale, but only a simplex quantized scale lacking subparts to which subevents could be mapped. Neither does it provide a lower closed quality scale. Comparison along a simplex scale is impossible:

- (52) a.???Carthage is slightly/ very / well /too destroyed.
 b.???Carthage is more destroyed than Rome.

Thus, the verb ‘to destroy’ cannot provide a temporal nor a quality scale of the right type, hence prefixation is ruled out.

5.2 *Upper closed and lower closed scales*

In the previous section we established that prefixation is only possible if the verb provides an appropriate monotonic scale. Yet, monotonicity is not the only requirement. We already saw that some accomplishments, in spite of being telic, do allow prefixation. Others do not. The reason for the split is that some accomplishments lexicalize an upper closed scale, where the maximum makes it non-monotonic and incompatible with the prefixes, while other accomplishments lexicalize a lower closed scale. Being bound only by a minimum point, the scale is open on the upper end and hence compatible with prefixation, even if the verb is telic.

Consider, for example, the following minimal pairs between an upper closed scale (53) and a lower closed scale (54). The verbs in (53) lexicalize an upper closed scale (Kennedy and McNally, 2005) and are telic. Hence, neither a temporal nor a quality scale may be an appropriate complement of the prefix. A subevent of a loading event is not a loading event, and if a certain vessel is partially loaded, it cannot be considered loaded. Yet, (53-a) is grammatical and ‘outload’ appears (though only once) in COCA. The reason (53-a) is possible is that the verb is used atelicly and the context introduces a different scale instead of the upper closed scale lexicalized by the verb

‘to load’. In (53-a) the telic loading event is coerced into an atelic repetitive interpretation, where the scale is not the volume of the vessel being loaded, but the number of vessels loaded. This scale substitution provides an appropriate scale for prefixation, hence such an interpretation leads to grammaticality, though restricted, of the examples with the telic upper closed scale verbs.

- (53) a. Each one would put up money that their division would **outload** the other one for those particular shifts, or that particular day. (COCA)
- b. ?The Coca-cola bottling machine out-fills the Pepsi-cola botting machine.
- c. ?The Samsung drier out-dries the Electrolux drier.
(the only instances of ‘out-dry’ on google mention a waterproof outerwear brand name...)
- d. ??Each one would put up money that their division would **out-empty / out-flatten/ out-straighten** the other one for those particular shifts, or that particular day.

In the same fashion, it is potentially possible to construct examples with other upper-closed scale verbs that sound relatively acceptable (53-b,c), but only under a multiple object reading, where the scale tracks the amount of objects filled or dried. This contrasts sharply with the lower closed scale verbs in (54):

- (54) a. The rage that I am filled with right now could **outheat** a thousand blue supergiant stars. (<https://en-gb.facebook.com/TheLametasticSpidey/.../306155069486371?>)
- b. The GTs don’t **outcool** every other fan nor are they even quieter than every other fan, but it’s that they do perform very well and the sound they do make is unlike every other fan ever made.
- c. As Robot Bender waits for the robot bending competition to begin at the Olympics he is confident that he could **out-bend** his competitors. (“Futurama” Bend Her (2003) Reviews & Ratings - IMDb www.imdb.com/title/tt0584433/reviews?)

Admittedly, such verbs are also not very frequent, but the examples in (54) do not enforce a reinterpretation of the verb or a repetitive meaning. The relevant scale in (54-a, b) is temperature (metaphorical or physical), lexicalized by the verbs, the relevant scale in (54-c) can be the extent to which Bender can bend himself or other things, depending on context. It can be the number or even the thickness of the objects bent, depending on the object of the competition, but there is nothing to prevent the bending extent scale from acting as the prefix complement.

Similarly, *over-* prefixation is only possible with lower closed scale verbs, such as ‘overheat’, ‘overcool’, ‘over bend’, but not ‘?overflatten’, ‘?overclose’, ‘?overempty’. The verb ‘to overdry’ is acceptable when we talk of skin (55-a), where dryness does not mean complete lack of moisture, but is unacceptable with objects like glasses, in which ‘dry’ lexicalizes an upper closed scale, i.e. complete lack of moisture.

- (55) a. This soap overdries your skin.
 b. #Be careful not to overdry the glasses.

In this context, it is unexpected that such verbs as ‘overfill’ and ‘overload’ are possible, as they lexicalize an upper closed scale. The difference is that the volume filled can be interpreted as a maximum point, or, alternatively, as the functional standard point, such that there is nothing preventing continuation of pouring/ filling / loading beyond it. In this way ‘filling’ is like ‘drying’, allowing the boundary to be interpreted as an absolute maximum or just a functional standard depending on the object, hence the additional flexibility.

5.3 Importance of functional standards

It is not sufficient for the verb to provide a monotonic scale, but it also must be a scale of the right type, providing the right elements. *Out-* requires a minimum point, expressed by the competitor in the direct object position and a scale with the upper end open. As long as there is a monotonic upper open scale along which comparison is plausible, the performance of the agent expressed by the direct object can provide the required minimum point. *Over-*, however, requires a standard

of comparison point, which is exceeded. Not every monotonic scale provides one, and there is speaker variation in respect to what to consider as an appropriate standard of comparison. Thus, while most speakers accept ‘overheat,’ the verb ‘overdance’ is much harder to contextualize, even though there are over 2000 results in google for the search (but none in COCA). The reason is that the verb ‘to heat’ readily provides a scale of change, as an ordering of temperatures, where it is easy to imagine that one of the temperatures in the ordering is the right one, and any higher value is too much. In the case of dancing, the temporal values may technically be ordered, or even the quality of dancing (potentially measurable by the grades assigned by dance-competition judges). Yet, it is hard for most speakers to envisage one of these values as any sort of standard, hence the restricted use of the sentences such as in (56), found on google. Also, in the prefixed form the presence of a direct object seems to ameliorate the sentences, as most of the examples on google had one.

- (56)
- a. Alas, it was stamped on the faces of mother and daughter that they had so overdanced themselves at balls that they had become almost wax figures. (N. Gogol. Taras Bulba: And Other Tales. - Google Books Result)
 - b. Inaba told him he overdanced the routine and because of that, was slightly ahead of the beat.
 - c. The judges thought she overdanced but was still good (‘Dancing With the Stars’ ABC News Blogs)
 - d. Carrie Ann said the problem with this dance is that you overdanced it.
 - e. Kolesnikova has danced Swan Lake for many years and I was worried that she had overdanced the role of Odette Odile. (Russkiy bazar)

Thus, ‘outdance’ is considerably easier to interpret, as the performance of the other dancer (in Accusative) provides a reference point, while for ‘overdance’ the verb does not, for most speakers, lexicalize a scale with a functional standard, though the context of dancing competitions may supply such a reference point for a speaker who is accustomed to evaluating dances.

The different contexts provide different scales, as we can see from (56). In (56-a) degree of exhaustion from dancing provides the scale, and a reflexive provides a direct object. In (56-b) ‘routine’ provides the direct object, and the relevant scale is probably how fast it was danced. In (56-c) there is no direct object, (c.f. ‘overeat’), and the amount of effort appropriate for the dance is exceeded, resulting in an exaggerated manner. In (56-d) the scale is the same, but the verb has a direct object. In (56-e) the instances of dancing the role are too many, so it is similar to the coerced repetitive readings, where the number of repetitions readily provides a scale. The highly restricted contexts and the diversity of the scales selected originates from the fact that the verb itself does not lexicalize an appropriate scale with a functional standard point, so context is the only potential source of one.

To sum up this section, the following requirement emerges: The verb may combine with the prefix if it provides a complex monotonic upper-open scale of change. In addition, *over-* requires the scale to provide a functional standard, and it also needs a direct object as a resultee. While *over-* combines with both manner and result verbs, as long as they satisfy all the requirements, *out-* does not combine with result verbs.

6. Conclusion

To return to the puzzle we started with, now we have derived the meaning difference in (1), repeated in (57), from the structural difference.

- (57) a. He outestimated his closest competitor.
b. He overestimated his closest competitor.

(57-a) is a process, while (57-b) is a result verb. The competitor in (57-a) is the specifier of a ScaleP containing an event variable coindexed with the main event, which is a process event, hence the active role of the object. The direct object of (57-b) is the specifier of a ScaleP. the event variable in which is closed in the resP, and the specifier is a resultee. The scales compared in (57-a) are the quality (accurateness) of estimations performed by the subject and the degree object. The scales

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compared in (57-b) are based on the quality of the direct object, such that the qualities assigned to the competitor in the estimation by the subject exceed the qualities actually possessed by him or her. The functional standard is the range of values that coincide with the actual qualities of the competitor. Both scales are open ended monotonic scales, which makes them acceptable.

Thus, the interpretation of the prefixed verbs is derived from structure, and the acceptability variation is predicted by the range of scales available in a given context.

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