Properties of event descriptions, specifically telicity, can be dependent on properties of a unique argument; this argument is homomorphic with the event. Homomorphism yields a homogeneous description if the homomorphic argument is homogeneous, and non-homogeneity otherwise. This paper argues that there is significant flexibility in the identity of the homomorphic argument within the same event description. This flexibility holds for verbs that participate in locative alternation, and also for degree achievements. The lack of unique homomorphic argument suggests that homomorphism is not always lexically determined. Data from Hungarian also shows that homomorphism is not sufficient to license telicity. It is only a preverb or some resultative, distinct from the verb and the homomorphic argument, which licenses a telic event description.

1 Introduction

Descriptions of eventualities\(^1\) can be classified as belonging to four (or five, cf. Smith 1997) aspectual classes (Vendler 1957). The aspectual classes of states, activities, accomplishments and achievements; and the additional fifth class of semelfactives are illustrated below.

\* I would like to acknowledge comments and discussions with Casper de Groot, Beáta Gyuris, Beth Levin, György Rákosí, Edward J. Rubin and Anna Szabolcsi, as well as by the audience at ICSH 9 and Chronos 2009. All errors are, naturally, mine.

\(^1\) I use the term event to include activities, accomplishments, semelfactives and achievements, and the term eventuality to refer to events and states (cf. Bach 1986).
Certain aspectual classes share some properties. States and activities are homogeneous (atelic). Given the description and an eventuality $e$ to which the description applies, there are proper parts $e'$ of $e$ such that the same description applies to $e'$. For instance, given an event of Heather running, there is a part of this event which is also an event of Heather running. Accomplishments, achievements and semelfactives are not homogeneous; they are telic. Accordingly, there is no proper part of the event of Heather writing a paper which is also an event of Heather writing a paper.\(^2\)

Telicity can be diagnosed, among others, by durative adverb modification. In English, durative for-adverbs appear with atelic eventuality descriptions, while in-adverbs are restricted to telic descriptions, as shown below (cf. Dowty 1979).

\[
\begin{align*}
(2) & \quad a \text{ Heather ran } \{\text{for an hour} / \,*\text{in an hour}\} \quad \text{(atelic, activity)} \\
& \quad b \text{ Heather slipped on the ice } \{\,*\text{for ten minutes} / \text{in ten minutes}\} \quad \text{(telic, achievement)}
\end{align*}
\]

It is widely accepted that the aspectual class of the eventuality description is not defined by the verb itself, but it is determined compositionally (cf. Verkuyl 1972). In addition to the verb, arguments and adjuncts can affect the aspectual properties of the description, as shown below.

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\(^2\) More precisely, excluding proper parts is not sufficient; it must be the case that the eventuality description holds for an event $e$, but not for a subevent $e'$ of $e$ which excludes (final) endpoint of $e$. 
This paper focuses on elements such as the theme in (4), where it is the properties of the element rather than its presence (cf. (3)) that affects the properties of the eventuality description. It is argued that elements like the theme of read (homomorphic elements) are not lexically determined for a variety of verbs, including degree achievements (e.g. cool) as well as the more well-known cases of verbs like spray and load. For such verbs, the element that determines event description properties is ambiguous, resulting in different interpretations of how the event proceeds and possible differences in how an event culminates. The relevance of these elements is also addressed. A significant crosslinguistic difference is the following: distinct themes in (4) yield atelic or telic event descriptions in English, but not in Hungarian.

The paper is organized as follows. Section 2 presents a more in-depth discussion of event descriptions and homomorphic elements, and addresses the properties of degree achievements in more detail. Section 3 establishes that homomorphic elements can be ambiguous for a given verb; thus the nature of the homomorphic element is not always lexically determined for verbs in general. It is also shown that in Hungarian preverbal elements can disambiguate the homomorphic element in an event description. Section 4 addresses homomorphic elements in more detail, and section 5 concludes the paper.
2 Events and homomorphic elements

An element in the event description can be homomorphic with the event. This element 'measure out' the event (Tenny 1994) in the sense described below. This section presents a brief overview of such elements and the types of event descriptions where they can appear. It is also shown that homomorphic elements affect properties of the event description as expected in English, but not in Hungarian.

2.1 Eventuality descriptions and homomorphic elements

As shown in (4), some non-verbal constituents in an event description can determine telicity. They affect the interpretation, however, in a more fundamental fashion. Given an event, the constituent can be homomorphic with the event; in other words, parts of the event correspond to parts of the referent of the constituent. Consider *Heather read the article*. In this event, parts of the article correspond to parts of the reading event, since the event progresses by reading consecutive chunks of the article (Krifka 1992, 1998, Jackendoff 1996, Ramchand 1997, Tenny 1994, a.o.). The event ends once the entire article has been read.

The homomorphic argument is not necessarily an object. It can be a path argument, possibly implicit (5), or a (change along a) scalar property (6). Given that there are no overt constituents that correspond to these, the general term *homomorphic element* will be used to refer to the elements that are homomorphic with the the event.

(5)  a Heather ran around the block / along the river (path)  
     b Heather ran to the ER (path)

3 In this characterization, I am ignoring (a) possible non-homomorphic interpretations (e.g. repeated readings of the same part) and (b) the possibility of not the referent, but some property or aspect of the referent (e.g. volume or length) is homomorphic with the event (cf. Hay, Kennedy and Levin 1999).
Since the element is homomorphic with the event, the properties of the constituent correlate with those of the event description. If the homomorphic element is homogeneous, then the event description is an activity (cf (5a), (6a)). The path in (5a) is homogeneous, as there is no endpoint specified; accordingly, the event description is also homogeneous. In (5b), in contrast, the endpoint is specified, and the event description is an accomplishment rather than an activity. The scalar property is homogeneous in (6a); there is no endpoint given for coolness. The event description is therefore an activity. In (6b) the scalar property is non-homogeneous; the endpoint is (the contextually sufficient) dryness. The event description itself is thus non-homogeneous as well, an accomplishment. The event descriptions discussed in this paper all contain a homomorphic element.

2.2 Degree achievements

The standard term degree achievement (Dowty 1979) is somewhat misleading; degree achievements are usually not achievements, but accomplishments. Nevertheless, the label will be maintained for those verbs which denote change along a scalar property. Among the examples above, cool and dry were examples of degree achievements. This section offers an overview of relevant properties of degree achievements, based on a variety of earlier discussions (Abusch 1986, Hay, Kennedy and Levin 1999, Jackendoff 1996, Kearns 2007, Kennedy and Levin 2008, Kenedy and McNally 2005).

4 It is possible, nevertheless, for a (maximal) endpoint to be specified, if there is a contextually determined temperature (lower than the temperature at the beginning of the event) that is reached by the end of the event. Note that no such endpoint is necessary or inherent; rather, it is possible if it is contextually determined.
The scales of the relevant properties (e.g. temperature or dryness) can be of various types. First, they can be \textit{open} or \textit{closed}. Here those scales will be referred to as \textit{closed} which have a maximal endpoint; \textit{open scales} lack such an endpoint. The scales corresponding to \textit{empty} and \textit{dry} are closed scales, since there is a maximal degree of emptiness or dryness, while the scales of \textit{large}, \textit{wide} and \textit{deep} are open. Scales can also have two or more values. The former, which will be called \textit{two-point scales}, include the scales of \textit{dead} and \textit{alive}; multi-point scales include those of \textit{dry} and \textit{deep}.

Whether a given scale is open or closed can be identified by modification by \textit{completely}. Only closed scales permit this adverb (cf. \textit{completely empty} / *\textit{deep}). The nature of scales determines the aspectual class of the predicate containing a degree achievement. With an open scale, the event description is an activity (unless a contextually salient maximal value is established). If the scale is closed, the event description can either be an activity or an accomplishment:

\begin{enumerate}
\item a The hole deepened \hspace{1cm} (open scale; activity)
\item b The shirt dried \hspace{1cm} (closed scale; activity or accomplishment)
\end{enumerate}

Given a closed scale degree achievement, the event description is an accomplishment if the maximal endpoint is reached by the end of the event. Otherwise, it is an activity, and a minimal change along the scale is sufficient.

Note that while an open scale degree achievement can appear in an accomplishment if there is a salient, arbitrary endpoint, this is crucially not an inherent property of the scale itself. The presence or lack of a maximal endpoint distinguishes the two degree achievements below. The \textit{in}-adverbs show that the event description is telic, an accomplishment in both cases in (8).
2.3 Event descriptions in Hungarian

The preceding discussion concerned event descriptions in English only. Let us briefly consider event descriptions and homomorphic elements in Hungarian. The discussion will first address degree achievements, and then turn to change of state predicates and predicates with path arguments. Before embarking on the discussion, though, note the Hungarian equivalents of a for-adverb (with the suffix -ig) of an in-adverb (with the postposition alatt).

(9) a  két órá-ig futott  Heather  
    two hour-until ran  H-nom
    'Heather ran for two hours'

b  két óra alatt írt egy dolgozatot  Heather  
    two hour under wrote an paper-acc H-nom
    'Heather wrote a paper in two hours'

The scales associated with degree achievements can be open or closed in Hungarian as well as in English, and modification by teljesen 'completely' identifies closed scales.\footnote{Crucially, teljesen is equivalent to 'completely' here, the other possible meaning of 'very much, extremely' (which is compatible with open scale degree achievements as well) is ignored.}

\footnote{5}{Crucially, teljesen is equivalent to 'completely' here, the other possible meaning of 'very much, extremely' (which is compatible with open scale degree achievements as well) is ignored.}
If degree achievements and the corresponding eventuality descriptions behaved alike in English and Hungarian, we would expect Hungarian open scale degree achievements to appear in activities and closed scale degree achievements to appear in activities and accomplishments alike. Given an event description that contains a degree achievement, this prediction is not borne out for closed scale predicates, however:

(11) a Az utat szélesítették a munkások (open scale, atelic)
    the road-acc widened the workers-nom
    'The workers widened the road'

b Az utat egyenesítették a munkások (closed scale, atelic)
    the road-acc straightened the workers-nom
    'The workers straightened the road'

In both cases, the event description is atelic, specifically an activity. Atelicity can be shown by the durative adverbs that can appear with the description; durative -i g adverbs are grammatical with both examples in (11), while an alatt-adverb is ungrammatical.

Telic descriptions appear with a preverbal verbal modifier (VM), which is italicized in the remainder of this paper. Both open and closed scale degree achievements can appear with such VMs, and in this case, they are telic, allowing modification by alatt-adverbs only.
The fact that the nature of the scale plays no role in determining telicity is unexpected. Unlike in English, in Hungarian the maximal endpoint of a scale by itself does not ensure that the degree achievement can appear in an accomplishment. Open scale degree achievements are also not restricted to activities.

Finally, note that as before, the telic interpretation with open scale predicates (e.g. *widen*) requires a contextually determined endpoint that is reached. The endpoint cannot be maximal, given that the scale is open and therefore lacks a maximal endpoint. In this respect, degree achievements with preverbal elements show the same contrast as in English (cf. (8)), but in English there is no overt difference between telic and atelic degree achievements.

Crucially, telicity is independent of the nature of the scale in Hungarian, but not in English.
Open and closed scale degree achievements are alike in appearing in activities without a preverbal element and in accomplishments if a VM is present. The non-homogeneity of the homomorphic element is, by itself, does not permit telic interpretation.

Paths and predicates with a path argument behave similarly in English and Hungarian. A specified endpoint, as in (14b), yields a non-homogenous path – and the path being homomorphic with the event, the event description is telic, non-homogeneous as well. Otherwise, both the path and the event are homogeneous (14a).

(14)  

\[\begin{align*}  
\text{(14a)} & & \text{Heather} & & \{\text{a háztömb körül / a folyó mellett}\} & & \text{futott} & & \text{(activity)} \\
& & \text{H-nom} & & \text{the} & & \text{block} & & \text{around / the} & & \text{river} & & \text{along} & & \text{ran} \\
& & & & & & & & & & \text{'Heather ran around the block / along the river'} \\
\text{(14b)} & & \text{Heather} & & \text{a sürgősségi-re} & & \text{futott} & & \text{(accomplishment)} \\
& & \text{H-nom} & & \text{the} & & \text{urgent-to} & & \text{ran} \\
& & & & & & & & & & \text{'Heather ran to the ER'} 
\end{align*}\]

Verbs of creation and consumption, where the theme is homomorphic with the event, are similar to degree achievements. A homogeneous and a non-homogeneous theme, given in (15a,b), respectively, both yield a homogeneous event description. A telic, non-homogeneous event description arises in the presence of a VM, such as the 'perfective' meg shown in (15c).

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6 In addition to a VM, a suitable resultative or goal expression can also yield telicity; these elements are not discussed here. Note also that if the homomorphic element is an indefinite, then the position of the element can affect telicity (at least in the case of verbs of creation and consumption, cf. Kiefer 2006). Preverbal themes yield an atelic description, and postverbal themes result in a telic interpretation:

\[\begin{align*}  
\text{(i)} & & \text{Heather} & & \{\text{egy képet festett / festett egy képet}\} \\
& & \text{H-nom} & & \text{a picture-acc} & & \text{painted / painted a picture-acc} \\
& & & & & & \text{'Heather painted a picture' (atelic / telic)} 
\end{align*}\]

Whatever the account of this pattern may be, the examples in (15) show that the non-homogeneity of a 'homomorphic' element does not guarantee a telic event description, which is sufficient for present purposes.
Without delving into the specifics of how the position of the theme correlates with telicity, let us note that the Hungarian pattern is unlike English in that a non-homogeneous incremental theme (the apple) cannot always yield an accomplishment in absence of a VM. In English, an atelic interpretation may be possible (cf. Heather at an apple for half an hour, but still didn't finish it), but a telic interpretation, where the entire paper is finished, is always available. In the Hungarian (15b) only an activity description is possible.

In sum, the homomorphic elements in Hungarian behave unlike their English counterparts. While it is true that a specified endpoint, for example for a path, yields telicity, a non-homogeneous homomorphic element does not guarantee that a telic event description is possible. The absence of a telic interpretation was shown for homomorphic themes and homomorphic adjectival scales as well. With the relevant verbs, telicity is only possible if a VM is present. This shows that the homomorphic element by itself cannot universally determine telicity for the event description; a fact that is especially surprising given the homomorphic mapping between the element and the event.
3 Variation in homomorphic arguments

For some verbs, it is possible that the event description containing that verb can appear with distinct homomorphic elements. The section discusses two types of such verbs, verbs that participate in 'locative alternation' and degree achievements. Verbs with a path argument, however, do not show such variation.

3.1 Locative alternation

In locative (spray-load) alternation structures, the accusative constituent may be either the theme or the location. The other (non-subject) constituent, the location or theme, appears as an instrument or location, respectively. The homomorphic element is the (accusative) object, underlined in (16)-(18).

(16)  a  Heather a  libazsirral  kente  a____rozskenyeret  
     H-nom  the  goose.lard-with  smeared the  rye.bread-acc  
     'Heather smeared the rye bread with goose lard'
     (telic ok for English, * for Hungarian)  
  b  Heather a  rozskenyérrre  kente  a____libazsirt  
     H-nom  the  rye.bread-onto  smeared the  goose.lard-acc  
     'Heather smeared the goose lard onto the rye bread'  
     (telic ok for English, * for Hungarian)
Given the previous observations about homomorphic elements, it is not surprising that such an accusative object always permits a telic event description in English, but not in Hungarian. A telic, accomplishment interpretation is possible only if (a) a preverbal element is present, or (b) the end result is specified in some fashion. Preverbs are shown in (17a,b); an overt resultative is given in (17c). All Hungarian examples in (17) are telic.

(17)  a  Heather a  libaszírral  meg  kente  a  rozskeneret
      H-nom the  goose.lard-with  preverb  smeared  the  rye.bread.acc
      'Heather smeared the rye bread with goose lard'

b  Heather a  rozskenyérre  rá  kente  a  libazsirt
      H-nom the  rye.bread-onto  onto  smeared  the  goose.lard-acc
      'Heather smeared the goose lard onto the rye bread'

c  Heather vékonyraRESULT  szeletelte  a  rozskeneret
      H-nom thin-onto  sliced  the  rye.bread.acc
      'Heather sliced the rye bread thin'

The fact that the homomorphic element is the (accusative-marked) object in these alternation structures, and it has a 'holistic' interpretation is well known (cf. Anderson 1971, Anderson 1977, Rappaport Hovav and Levin 1988, Pinker 1989, Tenny 1994, a.o. for English or more generally, and Ackerman 1992, de Groot 1998 for Hungarian).7 (18) shows that this is the case indeed; assuming a maximal interpretation of the definite expression, a continuation stating that not all of the object was affected is marked in both (18a) and (18b).

---

7 I am leaving aside a number of issues here, including the properties distinguishing those verbs that can participate in this alternation and those that cannot.
The characterization of a verb (in the absence of a VM) as being ambiguous and permitting either the affected argument or the location to serve as a homomorphic element is at odds with those approaches that assume the existence of an unmarked, default argument realization. Having a default realization amounts to one of the alternants in (16) being primary, and the other derived by some operation (cf. Pinker 1989, Ackerman 1992). At least for some verbs that participate in this alternation, the existence (and identity) of such a
default form is unclear. *Spread* and *smear*, for example, require both a location and an affected argument, and both may serve as homomorphic elements, as shown above.

### 3.2 Degree achievements

I propose, following Csirmaz 2009, that the homomorphic element is also ambiguous – and disambiguated by VMs – in the case of degree achievements.

With a bare degree achievement, which lacks a VM, the interpretation is ambiguous, similarly to (16). On the one hand, the event can be homomorphic with the scale of wetness as it applies to the affected argument. Given the initial state of wetness of the sponge, it becomes increasingly dryer. In addition to this, expected reading, there is another interpretation. Under this interpretation the event is seen in terms of the amount of liquid or moisture contained in the sponge, and the amount of liquid becomes less as the event progresses.

(19) A szivacs száradt (a napon)
the sponge-nom dried the sun-on

'The sponge was drying in the sun'

The two interpretations are fairly similar, and distinguishing them is not trivial. The following examples, where the event description contains VMs and where a given VM may be compatible with some constituents but not others helps to establish the contrast.

If the event description of (19) is amended with a VM, only one of these two interpretations becomes available. The two possible VMs are *meg* and *ki*; recall that a VM results in a telic event description (and with a closed scale degree achievement, the event
culminates):

\[(20)\quad \text{A szívac} \{\text{meg} \; / \; \text{ki}\} \text{ száradt}
\]
\[
\text{the sponge-nom} \quad \text{perfective} \; / \; \text{out} \quad \text{dried}
\]
\[
'\text{The sponge dried}'
\]

(21) highlights the contrast between the two VMs. With the affected arguments in (21a), only the VM \textit{meg} is possible, and only \textit{ki} 'out' is grammatical with the arguments of (21b).

\[
\begin{align*}
(21) \quad \text{a} \quad \{\text{Meg} \; / \; *\text{ki}\} \text{ száradt} \{\text{a ruha} \; / \; \text{a keze}\} \\
\text{perfective} \; / \; \text{out} \quad \text{dried} \quad \text{the dress-nom} \; / \; \text{the hand-poss-nom}
\end{align*}
\]
\[
'\text{The dress} / \text{his hand dried}'
\]
\[
\begin{align*}
\text{b} \quad \{\text{Ki} \; / \; *\text{meg}\} \text{ száradt} \{\text{a tó} \; / \; \text{a forrás}\} \\
\text{out} \; / \; \text{perfective} \quad \text{dried} \quad \text{the pond-nom} \; / \; \text{the spring-nom}
\end{align*}
\]
\[
'\text{The pond} / \text{the spring dried out}'
\]

The two sets of examples crucially differ in their entailments. Given a usual interpretation of a telic closed-scale degree achievement, the affected argument has the property denoted by the adjective at the end of the event. In other words, the affected argument of the degree achievement \textit{dry} is dry when the event ends.

This does not hold for the arguments in (21b); the pond and the spring are not dry once the event ends. In fact, the pond and the spring exist at the beginning of the event but not when it ends. Let us assume then that the VM \textit{meg} requires an affected argument for which the adjectival property holds at the conclusion of the event.

With \textit{ki} 'out', there is no such requirement. Rather, it must be the case that the amount
of moisture is determined in some fashion – either in terms of the water contained in the pond, of that which emanates from the spring, or determined by the liquid contained in the sponge. In the course of the event the liquid or moisture disappears, but it does not dry per se. In addition, it is necessary for the amount of liquid or moisture to be determined, e.g. by containment within the argument. If it is simply the case that there is some amount of liquid or moisture on the surface of the object, then the VM *ki 'out'* is ruled out (cf. (21a)).

The two interpretations corresponding to (21a,b) can be found in (20). I suggest that with the VM *meg* the sponge (gradually) becomes dry, as expected. If the VM is *ki*, then the event is seen as involving the amount of moisture or liquid contained instead, and at the conclusion of the event, the moisture disappears – once again, resulting in a dry sponge.

These readings appear to be productive, with the indicated readings arising with the appropriate VMs. Thus in (22) the event is seen as progressing in terms of the dryness of the wall or the table (with *meg*), or in terms of the moisture contained within them (with *ki 'out'*).

(22)  {**Meg** / *ki*} száradt { a fal / az asztal}

perfective out dried the wall-nom / the table-nom

'The wall / the table dried'

The proposed interpretations and their correlation with VMs is supported by (23). If in the course of the drying event it is only the surface of the argument *the wall* that is affected, the VM *ki 'out'* is ungrammatical (23a). Whenever it is explicitly stated that the width of the wall is also affected, both VMs are acceptable (23b). In (23b), *meg* is possible because it is conceivable that the entire wall undergoes drying, and becomes dry when the event ends. The interpretation where the wall determines the amount of moisture which evaporates is in line

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8 While the connection between containment and determining the amount of moisture / liquid needs to be further refined and made more precise, the intuitive connection appears to be tenable and seems to capture the desired distinction.
with the acceptability of *ki*.

(23) a A fal teljes felszíne {meg / ??ki} száradt
    the wall entire surface-poss perfective / out dried
    'The entire surface of the wall dried'

    b A fal teljes mélységében {?meg / ki} száradt
    the wall entire depth-poss-in perfective / out dried
    'The wall dried in its entirety' (the entire depth of the wall dried)

I suggest that this ambiguity is not restricted to Hungarian, but it is also found in English. For (22), for instance, the two readings described are also available for English. *Dry* can also appear with arguments like *the river* (cf. (21b)); though these descriptions also contain a particle in English (cf. *The river dried {up / out}*).

   Ambiguous interpretation with degree achievements is not restricted to *szárad*, but it can be found with other degree achievements as well. As shown in (24a), the VM *fel* 'up' may appear with some arguments, but not others. If both *fel* 'up' and *meg* 'perfective' can appear in a given event description, a consistent meaning difference arises (24b). With *meg*, the soup is interpreted as having attained the desired temperature at the end of the event. If the VM is *fel*, it is sufficient if the soup became warmer than at the beginning of the event – but no temperature needs to be specified in advance that the soup would need to attain.

(24) a {A pocsolya / a laptop} {fel / ??meg} melegedett
    the puddle-nom / the laptop-nom up / perfective warmed
b A leves \{fel / meg\} melegedett
the soup-nom up / perfective warmed
'The soup warmed'

c A sütő \{fel / ??meg\} melegedett 200 fokra
the oven-nom up / perfective warmed 200 degrees-onto
'The oven was heated to 200 degrees'

This characterization also bears on the markedness of \textit{meg} in (24a). Given that there is no specific temperature that (water in) the puddle or the laptop would need to reach, it is expected that \textit{meg} is marked. Not so for the VM \textit{fel}'up', because any increase in temperature will satisfy that description.

(24c) provides additional support for this contrast. An explicitly specified final temperature, \textit{200 fokra} 'onto 200 degrees' is only possible with the VM \textit{fel}. This is consistent if there is a uniqueness restriction on the endpoint of an event (the endpoint of an event can only be specified once; cf. Tenny 1994): the end or culmination of the event can only be specified once. Since \textit{fel} does not establish a definite endpoint, but merely requires increase in temperature, it can freely appear with the resultative. If the VM is \textit{meg}, then the maximal value along the scale must be attained. Let us assume that \textit{meg} denotes the maximum endpoint along the scale; thus the resultative that specifies the exact value of the endpoint violates the uniqueness restriction.\footnote{The VM \textit{meg} does not necessarily have a maximal interpretation. For instance, it may yield an inceptive interpretation for event descriptions, as in \textit{meg olvad} 'meg melt' (= start to melt) or \textit{meg szeret} 'meg love' (= come to love).}

In sum, degree achievements can show distinct types of ambiguities, but only if the event description contains no VM. Once a VM is present, the ambiguity disappears. For \textit{szárad}'dry', I suggested that it can be the dryness of the argument that constitutes the appropriate scale (is homomorphic with the event). Another type of ambiguity was suggested
to hold for melegszik 'warm'. Depending on the VM, the interpretation for the event
description either requires (a) maximal change (when a specific, possibly contextually
determined threshold must be reached) or (b) only a minimal change along the scale.¹⁰

The two types of ambiguities are distinct, since they either bear on the nature of the
homomorphic element or on the distinct interpretations for a given scale.

3.3 Paths

For homomorphic elements, it was argued that degree achievements and verbs that participate
in locative alternation can both allow flexibility in which element is homomorphic with the
event. I argue that this flexibility does not extend to predicates with a path argument (path
predicates for short). First, I establish that there exists a certain variation in the elements that
are homomorphic with these events. Then I argue that this flexibility is illusory, and that the
homomorphic element is always a path; what can vary is whether the overtly defined path is
the homomorphic path or a path distinct from it.

3.3.1 Variable paths, same homomorphic element

Consider first the following examples, where the path is not necessarily homomorphic with
the event:

(25) a Heather fel mászott a hegyre
    H-nom up climbed the mountain-onto
    'Heather climbed up the mountain'

¹⁰ These interpretations are suggested to hold for telic and atelic event descriptions with degree achievements
in English, respectively (cf. Kennedy and McNally 2005). Recall that in Hungarian the relevant event
descriptions contain VMs, and so they are all telic.
b Az út fel mászott a hegyre

the road-nom up climbed the mountain-onto

'The road climbed up the mountain'

The event described in (25a) is homomorphic with the path leading from an arbitrary point to a point on the mountain (usually the top of the mountain); at the beginning of the event, Heather is at the initial point of the path and at the conclusion of the event, she is at the endpoint. The same path in (25b) lacks a homomorphic interpretation. The eventuality description is a state rather than an event, so no element can be homomorphic, since states lack a homomorphic element.

Even with event descriptions (rather than states), the homomorphic element is not necessarily the path that is explicitly defined. For instance, in (26a) the two PPs define a path, but the fog can extend along a line that is perpendicular to that path (the path of the fog is marked by an arrow in (27)). There is a reading available for (26a) then which is an event description but the event is not homomorphic with the path denoted by the PPs.

Similarly, the change in the width of the crack (26b), in the extent of the storm front (26c) and in that of the snow in (26d) does not need to be homomorphic with the path specified by the PPs. It is sufficient that at the conclusion of the event, the fog extends from the pier to the point (26a), the crack is wider at the gate than at the north tower (26b), and so on. But the change does not need to proceed along that path.

(26)  

  a The fog extended (from the pier to the point)  
  b The crack widened (from the north tower to the gate)  
  c The storm front crossed the entire state of Colorado  
  d Snow covered the mountain (from the valley floor to the summit)
In terms of the present discussion, the possible interpretations can be seen as arising from the variation of the path that is homomorphic with the event. The homomorphic path can be either the path explicitly specified or a distinct path; in the latter case, the PPs can describe a property of the result state that holds at the conclusion of the event only. I suggest that the two interpretations arise because the event must be homomorphic to a path, but it does not need to coincide with the path that is determined by the PPs.

Even if the homomorphic path fails to coincide with the overt path, the eventuality can be an event rather than a state. This is shown by the acceptability of the adverb lassan 'slowly', which can only appear with event descriptions (cf. (28a)). In (28a) the snow can gradually cover the area in question, for instance by proceeding from the summit to the valley. At the conclusion of the event, the path determined by the PPs is fully covered. (28b) is similar to (26b); the event can be homomorphic with any arbitrary path, as long as at the conclusion of the event, the crack widens or grows in the direction indicated.

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11 For a detailed (and somewhat distinct) characterization of the interpretations and specific account, see Gawron 2009. Essentially, Gawron appeals to temporally and spatially indexed paths to account for the homomorphic and non-homomorphic over path readings, respectively. In this discussion the stative reading is largely ignored, but it is extensively discussed in Gawron 2009.
(28) a A hó (lassan) az egész hegyet be borította
the snow-nom slowly the entire mountain-acq in covered
a völgytől a csúcsig
the valley-from the summit-to
'The snow covered the entire mountain from the valley to the summit'

b A hasadék a toronytól a kapuig nőtt / ki szélesedett
the crack the tower-from the gate-to grew / out widened
'The crack grew / widened from the tower to the gate'12

In some sense, the flexibility of extent verbs like *cover* and *extend* are illusory; the event is always homomorphic with a path. It is an independent issue whether the path determined overtly is the homomorphic path or distinct from it.

I suggest that if the overtly specified path is not a homomorphic element, then it either holds for a result state (in the cases discussed above, where it appears in an event description), or it simply holds for a state. In the latter case, the eventuality description is a state rather than an event.

Before proceeding, let us address an argument put forward in Jackendoff 1996 (citing Verkuyl 1972 and Declerck 1979). Jackendoff argues that it is not necessarily the path that is homomorphic for some verbs of motion. For *flow*, for instance, he argues that the homomorphic argument can be the theme. In support, Jackendoff cites (29):

(29) Muddy water flowed over the dame for / *in two hours (Jackendoff 1996 (52a))

Note that a degree achievement (cf. *widen*) can also have the interpretations described. The interpretations discussed in section 3.2 for degree achievements do not arise here, since change along the scale of width for an entity is the same as change in the entity. In this respect, *widen* differs from *dry or cool*; in the latter cases, the change along the adjectival scale is distinct from a change that is homomorphic with the affected argument.
Even though the endpoint of the path is specified, the event description is atelic – thanks to the homogeneous theme, according to Jackendoff.

While the homogeneity of the theme does play a role, the putative homomorphism between the theme and the event does not hold. If it was possible for the theme to serve as a homomorphic element, then a non-homogeneous theme would guarantee the acceptability of an in-adverb. This prediction, as shown below, is false; thus we can conclude that themes are not homomorphic to an event description headed by a path predicate.13 More generally, it is possible to maintain the position that such event descriptions are always homomorphic with a path.

(30) 
   a Twenty million gallons of water flowed for / in two hours
   b Twenty balls rolled for / in an hour

3.3.2 Additional considerations

Before concluding this section, some additional points are in order. First, note that unlike in the case of locative alternations constructions and some degree achievements, path predicates do not show variation in preverbs according to the distinct interpretations.

The Hungarian (28a), repeated from above, is ambiguous as described. The path along which the snow extends can either correspond to the path determined by a völgytől a csúcsig 'from the valley to the summit', or be distinct from it. Recall that in the latter case it is only required that at the conclusion of the event, the snow cover the entire area specified, but the event does not need to be homomorphic with this path. Crucially, the preverb is be 'in' in both interpretations.

13 At this point, the source of atelic interpretation is ignored, and it is only the homogeneous nature of the theme that is relevant. In section 4.2, where I return to these data and the account proposed in Beavers 2009a, 2009b, I point out a possible way to handle bare plural and mass noun themes in such examples.
The snow covered the entire mountain from the valley to the summit.'

Similarly, the preverb is *ki* 'out' with the verb *szélesedett* 'widened' in both interpretations for (28b) above, irrespective of whether the homomorphic path is overtly specified or not.

The lack of variation in preverbs can be tied to the fact that the homomorphic element does not vary with these predicates. With the predicate *borította* 'covered' and the preverb *be* 'in', the result state of the entire theme covered must hold at the conclusion of the event. The specific path involved is irrelevant from this perspective. In fact, the event can be instantaneous, with no multi-point path involved. The preverb *ki* 'out' and the verb *szélesedett* 'widened' behave identically; as long as the theme is wider at the conclusion of the event, the description is true. It is irrelevant whether the theme is wider than it was at the beginning of the event, or whether by the conclusion of the event, some part of the theme is wider than some other part. If the event description is durative, then the event is homomorphic with some path or other. Crucially, these descriptions differ from those discussed in sections 3.1 and 3.2 where the preverbs vary and the identity of the preverb may show correlation with the (variable) homomorphic element.

Another issue to consider is the range of event descriptions which do not show the two readings; namely, when the overtly defined path must be homomorphic with the event. This is true for (25), for instance. The only possible interpretations are that of a state (for (25b)) or for an event which is homomorphic with the path specified (for (25a)).

I suggest that the unexpected reading, where the homomorphic path does not coincide
with the path overtly determined, can still arise if the overt specification can be understood as being sufficiently large to cover the interval determined by the path -- either at the conclusion of the event or during the event. Accordingly, for the predicate futott 'ran', the path faltól falig 'from wall to wall' is compatible with a distinct movement path if the space between the two walls is covered either during or after the event (32); but this requires the carpet to be sufficiently wide to cover this space.

(32) A szőnyeg {az ajtótól az ablakig} / {faltól falig} futott
the carpet-nom the door-from the window-to / wall-from wall-to ran
'The carpet ran {from the door to the window} / {from wall to wall}'

The relevance of the size of the event was noted by Gawron 2009. He suggests that "non-incremental (= non-homomorphic) paths occur when some part of the theme is involved in the event, typically with themes large enough for their parts to change in different ways" (Gawron 2009:38). The preceding discussion in the present paper indicates that it is possible for the entire theme to be involved in the event, and it is not necessary for parts of the theme to change in a non-uniform fashion. The size of the theme does matter, as noted above.

Even though the two interpretations are available for run, cover, widen and their Hungarian equivalents, the interpretation of the overt path can vary to some extent. With widen (given the reading where the overt path is not homomorphic with the event), the theme must be narrower at the source and wider at the goal. The orientation of the path does play a role. With run and cover, as well as their Hungarian counterparts, the orientation of the overt path is irrelevant; switching the source and the goal yields an equivalent description. In the latter case, the endpoints of the path are relevant for the relation between (cf. the possible paraphrase the carpet ran between the wall and the wall for (32)). I suggest that this
difference arises from the fact that *widen* describes a change in the (width of the) theme itself, while *run* and *cover* do not; with the latter verbs, the change necessarily affects the theme in a uniform fashion. If the overt path is not homomorphic with the event, the theme shows no distinguishable behavior with respect to the path, since the only relevant change happens along the covert path.\textsuperscript{14}

In sum, it was argued that event descriptions with a homomorphic element can allow variation in the specific homomorphic element. Verbs that participate in locative alternation and some degree achievements show such flexibility: the homomorphic element is either the affected argument or the location (for the former) or the adjectival scale or some other entity undergoing a change (e.g. moisture for *dry*) (for degree achievements). As far as path predicates are concerned, the flexibility does not hold; the event is homomorphic with a path argument. The path, however, may or may not correspond to the overt path. The ambiguity associated with the first two types of verbs correlates with overt differences in Hungarian; the distinct homomorphic elements appear with different VMs. The correlation between preverbs and homomorphic elements is further explored in the following section.

4 Preverbal elements and homomorphic elements

Some verbs were argued to appear in event descriptions where the homomorphic element is not unambiguously determined. In English, the only overt difference between the two event descriptions arises in locative alterations. The homomorphic element functions as the direct

\textsuperscript{14} This difference is distinct from the characterization offered in Gawron 2009:49, who distinguishes *cover*, *extend* and *cross* from *widen* by asserting that along the temporal axis, the former can only denote a state, but *widen* also allows an event interpretation. The characterization offered in the text differs from Gawron's view, since the uniformity of the theme (which is lacking with *widen*) holds for event and stative readings alike -- it holds for genuine states and for events with a different homomorphic path. The contrast is expected to be available with a stative reading along the temporal axis then, so the possibility of an event reading along the temporal axis is not crucial.
object; it is either the affected argument or the location which functions as an object. In the case of degree achievements there is no overt reflex of this difference. The event description is the same, irrespective of whether the affected argument or the adjectival scale is the homomorphic element.

VMs in Hungarian can vary according to the nature of the homomorphic element. If the homomorphic element in a given event description does not vary, then there is no flexibility in terms of the VM that may appear as part of the description. Accordingly path predicates show no variation in VMs that would correlate with differences in homomorphic elements, but the other two types of event descriptions do.

The correlation between specific VM and homomorphic elements is consistent with the claim that the homomorphic element is not lexically determined. This section sketches a possible approach to the role of preverbs in the interpretation of event descriptions.

4.1 VMs and homomorphic elements

Concerning the role of VMs (idiomatic interpretations aside), it should be noted that they always disambiguate an event structure description that is ambiguous if VMs are absent. They also introduce telicity; only an atelic interpretation is available if the description contains no VMs, and a telic interpretation is possible with VMs.\(^{15}\)

The disambiguating function relies on lexical specification of the verb; a VM cannot introduce a new scale or path. For a degree achievement, for example, no VM can introduce a path. Similarly, for the degree achievement *melegít* 'warm', it is possible that the event is always homomorphic with the adjectival scale, so no ambiguity is present (cf. section 3.2). If this characterization is accurate, then it is expected that there is no VM which will permit an

\(^{15}\) Here I am simplifying somewhat, with those event descriptions in mind that were discussed above. Recall that in addition to VMs, resultative expressions can also yield a telic description. Also, not all VMs result in a telic description, cf. (34) below.
interpretation where the event is homomorphic with the theme, or some scale other than the
temperature of the affected argument.

An approach compatible with these facts is a view of VMs as agreeing elements. Given a verb with ambiguous homomorphic elements, a VM will agree with one of those elements and thus force an unambiguous interpretation. For the verb szárít 'dry' the VMs may agree either with the scale of dryness of the affected argument (meg) or with the dryness in terms of the moisture (ki 'out'). For path predicates, the VM agrees with the path, which is the only homomorphic element for these verbs.

This approach cannot apply to all descriptions wholesale. Consider (33). A homomorphic affected theme argument appears with meg (33a), but the same VM – or the VM be 'in' – is found with a homomorphic location (33b). Even though the thematic roles of the homomorphic elements are distinct in (33a,b), it could be possible to extend an agreement-based treatment to these examples.

(33)  

a  Heather meg ette a kenyeret  
H-nom perfective ate the bread-acc  
'Heather ate the bread'

b  Heather {meg / be} kente a kenyeret zsírral  
H-nom perfective / in spread the bread-acc lard-with  
'Heather spread the bread with lard'

c  Heather rá kente a zsírt a kenyérre  
H-nom onto spread the lard-acc the bread-onto  
'Heather spread the lard onto the bread'

(33c), however, presents a problem. The VM rá 'onto' is clearly related to the locative
argument (e.g. by pseudo-incorporation, cf. Surányi 2009), so it is not clear how agreement could hold between the affected argument and the VM. It is conceivable that a VM can either agree with the homomorphic element, or denote a goal. Goal-denoting VMs require the existence of a path, but the path does not need to be homomorphic with the event. Locative alternations such as (33c) and stative predicates like (34), where the VM is *el*’away' are a case in point. The homomorphic element in (33c) is not the path but the accusative constituent, in line with generalizations about homomorphic elements in locative alternation structures in general.

(34) Az út el ért a városig
   the road-nom away reached the city-onto
   'The road reached the city' (possibly stative)

Recall that path predicates are unambiguous with respect to the homomorphic element, as argued in section 3.3. This is a surprising fact; it would be expected that degree achievements and the descriptions of the type discussed in section 3.1 would pattern identically to path predicates (cf. Hay, Kennedy and Levin 1999, a.o.). All three types of event descriptions involve an affected argument and a scale (possibly a path), so their divergent behavior is surprising. I tentatively suggest that the unexpected behavior is due to a difference in the lexical specialization of the corresponding verbal elements. Path predicates specify a single homomorphic element, while the other event description types have an ambiguous specification as discussed above.

4.2 No ambiguity in homomorphism?
The view of homomorphism presented above is in stark contrast with that of Beavers 2009a, 2009b, who also discusses multiple homomorphisms. Beavers is concerned with examples of the following types:

(35)  a  The carafe of wine flowed from the jar to the floor in / ? for five minutes  
      (Beavers 2009a: 94)  
      b  Wine flowed from the jar to the floor for / ?? in five minutes  
      (Beavers 2009a:95)

(36)  a  Caesar wiped the table clean (in / ? for an hour)  
      (Beavers 2009a:103)  
      b  Caesar wiped tables clean for / ?? in an hour  
      (Beavers 2009a:103)

First, Beavers observes that the predicates he considers (including flow and wipe) have a homomorphic argument (the path for wipe and a property scale for wipe (clean)). Standard considerations predict that the properties of these homomorphic elements will determine properties of the event description: if the element is homogeneous, then the event description will also be homogeneous (i.e. atelic), and if the homomorphic element is non-homogeneous, then the event description is similarly non-homogeneous (i.e. telic).

These predictions are clearly not borne out in the preceding examples, where the durative adverbs establish (a)telicity (in-adverbs can appear in telic event descriptions and for-adverbs are restricted to atelic event descriptions and states). A non-homogenous path (35b) or a non-homogeneous property scale, with the endpoint (clean) specified (36b) can appear in a homogeneous, atelic description. It seems clear, then, that the allegedly homomorphic elements are not necessarily homomorphic with the event.
In a nutshell, Beavers argues that homomorphism is not restricted to the element usually described as such. Both (a) the affected argument (the figure) and (b) the path (or equivalently, a property scale) play a role in determining the properties of the event. This is ensured by assuming that predicates have an event, a figure and a path argument, and the homogeneity of either the figure of the path is sufficient to yield atelicity for the event description. In other words, the event description is telic only if both figure and path are non-homogeneous.

Beavers suggests that the figure and the path along with the homomorphic mapping between these and the event are simply different ways of carving up the event (cf. Jackendoff 1996). He conflates two structures, one that consists of subevents corresponding to parts of the figure, and one that consists of subevents corresponding to parts of the path. The members of these two sets of subevents can be conflated by identifying for each part of the figure the parts of the path that it traverses (or vice versa). Crucially, if an event description is atelic only if the event description can apply to the event and a proper subevent, then either a homogeneous path or a homogeneous figure yields atelicity, as desired.

Beaver's data and approach crucially require that either the figure or the path be able to yield homogeneity for the event description. This is inconsistent with the idea that homomorphic elements may not be lexically specified, but show flexibility in the interpretation of an event description.

I suggest that even with a homogeneous figure, *in*-adverb modification is possible; a possibility incompatible with Beavers' approach. For bare plural objects, *in*-adverbs can specify the duration of an (atomic) event which affects a single entity. Accordingly, even a bare plural incremental theme (*apples*) or a figure in an event with a figure and a path (*tables*) are compatible with an *in*-adverb:
(37)  a  Heather ate apples {in five minutes / for two hours}
      b  Caesar wiped tables (clean) in five minutes

Similarly, \textit{in}-adverbs can modify an event description if the figure is a mass noun:

(38)  a  Water flowed again in two days
      b  Water flowed to the filter in ten minutes (and oil in twenty)

The adverbial modification is consistent with the view that homomorphism is ambiguous. It is possible to maintain that in \textit{Caesar wiped tables clean}, there is a minimal, atomic event, which can be homomorphic either with the property scale (\textit{wipe (clean)}) or with the affected argument, \textit{a table}. Both of these elements yield a non-homogeneous, telic event. The bare plural \textit{tables} yields an iterated event, however, and since iteration is not restricted, the resulting complex event is homogeneous (and so amenable to \textit{for}-modification).\footnote{Of course, in absence of a distributive interpretation (e.g. \textit{Caesar ordered / saw tables}), the issue of atomic events does not arise.} I suggest that a comparable interpretation is available for mass nouns as well, where it is possible that proper parts of the maximal entity are considered. Such an interpretation is required in (39).

(39)  Home-made jam makes good gifts

Note that the presence of a homogeneous element does not guarantee atelicity even within a simple, non-iterated event, contra the spirit of Beavers 2009a, 2009b. This was discussed in sections 3.1 and 3.2 in connection with the different readings imposed by preverbs in Hungarian.

The relevant point in connection with (40) is the following: the determinerless
affected argument (libazsírral 'goose lard-with', (40a)) and the minimal change along the
temperature scale in (40b) should enforce an atelic event description according to Beavers.
For him, either a homogeneous figure or path suffices to rule out telicity and enforce an atelic
interpretation. This prediction is clearly falsified for the examples below; the event
descriptions can only appear with in-adverb equivalents:

(40)  a  Heather (tíz perc alatt / ??tíz Percen át) meg kente
         H-nom ten minute under/ ten minute-on across perfective smeared
          a kenyeret libazsírral
         the bread-acc goose.lard-with
  'Heather smeared the bread with goose lard (in ten minutes / ??for ten minutes)
  b  Heather (tíz perc alatt / ??tíz Percen át) le hűtötte
         H-nom ten minute under/ ten minute-on across down cooled
          a levest
         the soup-acc
  'Heather cooled the soup (in ten minutes / for ten minutes)\(^\text{17}\)

I conclude that the ambiguity of homomorphic elements can be maintained, and that the facts
in (35)-(36) require an alternative account, possibly in terms of (atomic) event iteration.

\(^{17}\) Recall that the ambiguity in the English translation arises from the fact that cool can be interpreted as
requiring a minimal change along the temperature scale (atelic), or as requiring that a convential value along the
temperature scale is reached (telic). In Hungarian, the preverb le 'down' forces a telic interpretation and a
minimal change along the scale.
5 Conclusion

Properties of event descriptions can be compositionally determined. This claim is far from being novel; the fact that the telicity of a description is not exclusively defined by the verb was argued by Verkuyl 1972 among many others. Hungarian VMs fit neatly in this respect; a VM can yield telicity for an event description that is atelic if a VM is absent.

The possible interpretations with VMs, given event descriptions that contain an element which is homomorphic with the event, reveal another property that can be seen as compositional. It was shown that some event descriptions which contain no VM are ambiguous with respect to the homomorphic element, while a VM disambiguates the two interpretations. The flexibility in the homomorphic element was argued to extend to degree achievements. For dry, the two possible interpretations referred either to the degree to which the affected argument was dry, or to the degree to which some amount of moisture or liquid disappeared. The ambiguity of the bare, VM-less event description on the one hand and the unambiguous interpretation of descriptions with VMs on the other make it attractive to assume that the predicate does not determine a unique, default event description (contra Pinker 1989 and other approaches which assume some argument structure changing operation for locative inversion).

In Hungarian VMs are also relevant for telicity. If a VM (or some other constituent with a result interpretation) is absent, the event descriptions are atelic. This fact is surprising, given that it is expected that a homomorphic element that is non-homogeneous will yield a telic interpretation for the event description. This expectation is clearly not borne out in Hungarian. It is consistent, nevertheless, with the behavior of (some) achievements and semelfactives. Either a VM or a resultative non-VM phrase is necessary in event descriptions like (39); this is expected if telicity arises only if these items are present, and if these
descriptions are necessarily telic.

(39) a Heather *(meg) halt
     H-nom perfective died
     'Heather died'

b Heather *(el / a földre) esett
     H-nom away / the ground-onto fell
     'Heather fell'

Emphasizing the independence of telic interpretation in Hungarian from other properties of event descriptions (cf. instantaneous event descriptions and non-homogeneous homomorphic elements) is significant since it further highlights the compositional nature of event structure properties. As Hungarian shows, it is not necessarily the case that an event structure is necessarily telic even when it would be expected to mirror the properties of the homomorphic element. Mapping between the properties of the event description and the homomorphic element are imperfective – with the exact nature of imperfective mapping is a task left for further research.

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