Aspect: A local or global account*

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SUMMARY

A general disagreement within the aspectual literature is whether aspect is a composition derived primarily by pragmatic operations or operations from other linguistic modules such as semantics and morphology. The purpose of this paper is to present the outline of a psycholinguistic experiment investigating the cognitive nature of aspectual realization. Specifically, the experiment is designed to shed light on whether aspect is derived via local (semantic) or global (pragmatic) processing. The core hypothesis being English aspect is a grammatically driven phenomenon residing primarily at the semantic/pragmatic interface. The motivations behind this stem from recent theories which distinguish telic from atelic readings using scalar semantics. The paper is organized as follows: section 1 discusses the background of how aspect is encoded under a scalar account, section 2 presents the working hypotheses and predictions for the experiment, section 3 describes the methodology, stimuli and procedure, section 4 includes future directions for a secondary experiment and section 5 concludes.

RÉSUMÉ

Il y a souvent un désaccord dans la littérature à propos si l'aspect est principalement composé d'opérations pragmatique ou d'opérations de autres systèmes linguistique comme sémantique et morphologie. Le but de ce papier est de présenter le plan d'une expérience psycholinguistique qui examine le genre cognitive de réalisations aspectuel. L'expérience est construite pour exposer si l'aspect est dérivé de processus local (sémantique) ou global (pragmatique). L'hypothèse est que l'aspect d'anglais est un phénomène grammatique qui habite principalement à l'interface de la sémantique et pragmatique. Les motivations de ce projet viennent de nouvelles théories qui distinguent les lectures telic et atelic par utiliser les sémantiques scalaires. Le papier est organisé comme suit : Section 1 parle à propos du contexte de comment l'aspect est encoder scalairement, section 2 présente l'hypothèse et les prédictions pour l'expérience, section 3 présente la méthodologie, le stimulus et la procédure, section 4 parle de directions pour une deuxième expérience, et section 5 conclus.

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1 GOAL

The goal of the experiment is to address two questions: is English aspect a local or global process and is this process competition based? The first question is pertinent upon the second, which is derived from Filip's (2008) characterization of telicity as a result of maximalization of events. These questions will be tested using a working memory paradigm as this methodology can be sensitive to systems with competition.

2 BACKGROUND

Theories attempting to capture how English aspect is encoded can be categorized into two distinct families: accounts which are lexically or compositionally motivated. The background of this paper discusses how prominent theories from both approaches lend themselves in respect to the distinctions this experiment sets out to make.

The most notable lexical account for English aspect is Vendler's (1957) classification of verbs. A verb can be categorized into one of four classes (states, activities, accomplishments and achievements) based on its inherent lexical features. The three temporal features which determine a verb's aspectual class, extended by Smith (1999) are: punctuality, telicity or dynamicity. State verbs are unmarked with all three features and reflect events which have no dynamics or require additional energy to continue (e.g. *love, see, hate, want*). Activities are only marked with dynamicity as the events of these verbs run over a duration of time but arbitrarily select for an endpoint. Thus activities have a homogeneous structure (e.g. *Mary is running, play, sing, dancing*). Accomplishments differ in one respect from activities; they are marked with telicity in addition to dynamicity and therefore lexically select for an endpoint (e.g. *run a mile*, *eat a bushel of apples*). Lastly, accomplishments are marked with all three features and are verbs whose events occur instantaneously, possessing no proper-subparts as the event can only be reduced to a single point in time (e.g. *die*, *reach the top of the mountain*). Therefore Vendler argues all essential semantic features are encoded in the lexical entry and it is these features which dictate which aspectual class of the VP the verb appears in.

With this said, Vendler's classification is solely descriptive. The theory indeed presents a systematic way to categorize verbs, but does not extend beyond that. Since the purpose of the experiment is to distinguish if aspect is a local or global process, it is hard to see how this theory lends itself to being tested in this respect. This is not to say Vendler's account cannot somehow be extended to test behaviourally. However, the research question here needs to be motivated by an internal global vs. local theory. Vendler's account does not make this distinction nor does it allow itself to be extended to fit the proposal of the experiment.

Theories developed under the compositional approach do however make this distinction. Under this perspective theories are based on thematic relations at the VP level which are captured via event semantics. Event semantics capture aspectual realization in terms of operations which are either semantically or pragmatically motivated. One quick note regarding event semantics however: as the experiment is focusing on English aspect, a critical distinction must be made regarding perfectivity and telicity.

Verbs in Slavic and Romance languages are aspectually marked as perfect or imperfect. In these languages the verb's membership in one of these classes and is grammatically determined

by the verb's syntactic distribution and semantic properties (Filip, 2008). The impefective describes a continuous reading as the event is interpreted to be ongoing, whereas the perfect reflects events that have terminated (Giorgi & Pianesi, 2001) or the "totality of an event" (Filip, 2008). English verbs are not marked with this distinction and so reflect different telicity effects. Telicity describes an event which reaches a boundary, endpoint or *telos* (Giorgi & Pianesi, 2001) whereas atelicity is where an event reaches no such boundary, but has the potential to.

Event semantics models the mereological mappings between the progressions of events denoted by the verb and a specific property denoted by its predicate. Crucially, the distinction between telic and atelic expressions stem from the predicates subinterval properties (Bennett & Partee, 1972; Dowty, 1979, 1991; Krifka, 1992, 1998 among others). Atelic expressions such as *push the cart* carry this property, as any subinterval event of *pushing* at any interval of time holds true. This is not the case however for telic expressions such as *eat the apple* where the state of the apple changes over the period of the *eating* event. This mapping is true for both types of distinctions but as English is being considered, the notion of event semantics adopted for this experiment refers to the mappings of telicity not perfectivity.

Event semantics provide a key component which lends itself to being empirically tested: a grammatical motivation for how aspect is derived. Mapping relations are systematic and arguably grammatical, as they capture logical progressions of how events unfold based on the semantic properties of the verb and predicate. Since the experiment sets out to test whether aspect is derived via grammatical or pragmatic principles it requires motivations from a theory presenting components satisfying either of these modules. The mereological nature of event semantics does just this. In addition, the relationship between a verb and an incremental theme also provide another testable component. Essentially, this relationship is composed of two variables which when manipulated can create either telic or atelic outputs. This component lends itself nicely to stimuli creation, as it provides potential independent variables for the experiment.

After comparing both approaches the experiment adopts the following components as theoretical motivations to test the cognitive nature of aspectual realization: verbs can possess lexical features which render distinct aspectual readings, the mapping relations between a verb and an incremental can also produce distinct readings, and in addition provide a systematic operation the grammar potential uses. All of these properties serve as testable components to use with a working memory paradigm. Specifically, the experiment uses Filip's (2008) theory which incorporates all of the components mentioned above. The next section outlines her theory in detail.

2.1 EVENT MAXIMALIZATION

Filip (2008) argues telicity relies on a maximalization operator in the domain of events. Under this view telicity arises through the grammar of measurement or scalar semantics specifically defined in (1):

(1) Telicity corresponds to the maximalization operator MAX_E. It is a monadic operator, such that $MAX_E(\sum)$, which maps sets of partially ordered events $\sum$ onto sets of maximal events $MAX_E(\sum)$. (Filip & Rothstein, 2006)

The definition asserts that telic predicates denote event entities that are countable. This characterization satisfies the requirements of the maximalization operator as it requires a partial ordering in order for an event to reach culmination. A partial ordering in turn can be realized as a scale. Filip adopts Kennedy's (2005) classification of a scale possessing the following parameters: a set of degrees, dimension and ordering relation.

Crucially, MAX_E cannot directly apply to a scale of objects, only a scale which measures quantities. Thus the ordering of events along this type of scale reflects the progression of events evolving into "more developed versions" (Landman, 1992).

The formal semantics denoting the mapping of parts of the scale onto parts of events is captured using Krifka's (1986, 1998) lattice structure defining Strictly Incremental Theme relations:

(2) A part of the meaning of strictly incremental (SINC) verbs is characterized by a homomorphism entailment: a homomorphism between the lattice structure (part-whole structure) associated with the event argument *e* and the lattice structure associated with the Strictly Incremental Theme argument *x*. The thematic relation Θ is strictly incremental, iff

a. $MSO(\Theta) \wedge UO(\Theta) \wedge MSE(\Theta) \wedge UE(\Theta)$ and

b. $\exists\, x, y \in U_P\ \exists\, e, e' \in U_E\ [y < x \wedge e' < e \wedge \Theta(x, e) \wedge \Theta(y, e')]$ (Filip, 2008)

This definition ensures a strict one-to-one mapping between proper parts of an event with the proper parts of an object. The uniqueness of objects (UO) relates to the requirement that thematic relations are viewed as functions. The uniqueness of events (UE) allows for events involving instances of objects to be subjected at the most to one event instance of a given type. The mapping to subobjects (MSO) prohibits proper parts of an event mapping to a whole object *x*. Lastly, the mapping of subevents (MSE) ensures no proper part of *x* maps to the whole event *e* (Filip, 2008).

However, MAX_E is also compatible with incremental verbs (INC) and scalar verbs as they too have scalar properties. The first imperative difference between incremental (SINC/INC) and scalar verbs is the ordering scale lies at the VP level for the former and V level for the latter. Secondly, the entailment properties between all three verbs differ as well.

Scalar verbs entail both a non-trival measuring scale and object-event homomorphism, whereas incremental verbs only entail the homomorphism (Filip, 2008). Specifically, SINC verbs entail a homomorphism between the proper parts of an event and an individual. Although INC verbs can reflect a homomorphism, it is not via an entailment. Instead a temporal trace function is required in order to successfully map the homomorphism of the aspectual composition (Link, 1987). This is because INC verbs describe events which parts of the incremental object can be subjected more than once. For example, the verb *read* differs from *eat* in the respect that there may exist two subevents of reading that both map to the whole event of reading (as in re-reading a chapter). However, this property does not hold with *eat* as you cannot re-eat part of an apple. In this way, the ordering of events and direction of the scale for INC verbs does not always reflect the true definition of SINC verbs where one stage of an event grows into a larger one (Filip, 2008).

A final note regarding the operator MAX_E how it operates in respect to telic vs. atelic constructions. The entailments elicited by scalar and incremental verbs do not guarantee maximality as seen in the following examples.

(3) SCALAR: The snow melted in six days/for six days, but it did not melt completely. (Filip, 2008)
(4) INC: John read the grant proposal in an hour/for an hour. (Filip, 2008)
(5) SINC: The muffins baked in an hour/for an hour.

Both verb types are inherently atelic as there is nothing in the grammar enforces them to denote maximal events; it is the combination of the verb *and* theme which when combined, elicits a scale denoting a maximal entity the operator selects for. If the scale is unbound, MAX_E is incapable of selecting a candidate. This is because the homomorphic mapping of events can be interpreted as reaching an endpoint or not, as its truth conditions hold under negation as seen in (3). The operator does not encounter this problem in telic constructions as the mapping relations reach an explicit boundary or culminate, allowing for only one possible interpretation.

3 PROPOSAL

As mentioned, the purpose of this paper is to outline a psycholinguistic experiment seeking to unearth the cognitive nature of aspectual realization. The theoretical underpinnings laid out in the previous section thus give way to several predictions that can be empirically tested. This section extends the theory of MAX_E to form the working hypotheses.

3.1 THE IDEA OF COMPETITION

The current experiment sets out to discover whether the grammatical operator presented by Filip (2008) is recruited for utterances in which aspect is composed via a scalar mechanism. The first question which arises is how MAX_E can be tested empirically.

Crucially, it is the scalar property which drives the aspectual composition. If telicity is characterized in terms of maximality it follows that this operation requires its argument to introduce some partial order. Filip sides with Zucchi (1999) in that events never culminate per se and so can be defined as "discrete maximal units that populate the domain of adverbial quantification" (Filip, 2008 pg. 3). These units are partially ordered or, as explained by Filip can be taken as elements along a scale which by default proceed in a ">" greater than relation. For example, in the sentence *the water froze* the verb *freeze* elicits a scale from which the water goes from a non-frozen state (liquid form) to a frozen state (solid form). Along this scale are units each reflecting a gradual increase of the event of the water becoming more solidified until it reaches a state of maximality (i.e. its solid form). The partial ordering satisfies the requirements of MAX_E where it then "picks out the unique largest event" (Filip, 2008 pg. 1). With this said, it can be argued if a scale reflects a set of multiple distinct units this can be seen as competition: an instance where more than one possible candidate can be selected to satisfy a truth condition. If MAX_E is recruited then it can be hypothesized that it will facilitate the realization of telic expressions as only one candidate from the set serves as the maximal entity.

Recall though, that MAX_E operators differently between telic and atelic constructions. Thus two predictions can be made here based on the idea of competition: 1) as stated above, telic constructions will be processed more efficiently as the scale possesses only one maximal entity for MAX_E to select, 2) atelic constructions will be processed slower in comparison as their scalar set is unbound and thus holds no explicit maximal entity.

Both construction types elicit a scale with a reference point, however only in telic instances is the operator recruited to compare candidates along the scale to select the largest. Thus the process is facilitated with ease by the operator. In atelic situations no operator is used to compare candidates and thus no "largest" candidate is selected. In other words, the scale is left open or unbound. The nature of atelicity allows for either an open or bound interpretation in instances where no explicit endpoint is specified and can thus be seen as ambiguous. Therefore, as MAX_E is unable to select a unique candidate to satisfy the truth conditions, the system must resort to another strategy to recover. Regardless if the interpretation is saved due to context or other pragmatic principles, atelic constructions do not appear to be facilitated by a grammatical operation and require higher levels of processing. It is precisely this additional step which leads to the prediction that atelic constructions will be more cognitively costly.

3.2 DEFAULT ASPECT

However, the results from the experiment can be interpreted in another light if the behavioural evidence fails to support the primary hypothesis (telic expressions are realized faster than atelic ones). The paradigm used to test Working Memory (elaborated in the section 3) can test for memory capacity, competition *or* default processing.

A common ground exists between scalar implicatures and MAX_E, that being of course they both possess a scalar property. Recent studies using behavioural techniques, such as working memory, to investigate the default nature of scalar implicatures suggests the processing of scalar implicatures requires cognitive resources from working memory (Noveck, 2001). This is reflected by results illustrating the *some but not all* (pragmatic) interpretation of the implicature is cognitively more costly than *some in fact all* (logical), as its processing does not survive when cognitive loads increase. This observation serves as evidence supporting that the pragmatic interpretation is not automatic (Bott & Noveck 2004; de Neys et al., 2007). These findings are furthered supported by evidence from developmental behavioural studies which suggest typically developing children compute implicatures in their logical form rather than pragmatic (Guasti et al., 2005; Papafragou & Musolino, 2003; Noveck, 2001).

Thus, aspect as a grammatical operation using scalar semantics can be tested in a similar manner. By testing the processing differences between scalar and SINC/INC verbs, results reflecting automaticity can also be reflected under the working memory paradigm. If the results from the experiment do not support the predictions of section 3.1, in other words the opposite is true (atelic expressions are computed more easily than telic ones), the results will serve as evidence supporting atelicity is the default aspectual process as suggested by Filip (2008).

In summary, the proposal speculates that aspectual composition is a grammatically driven process which recruits a scalar operator MAX_E (Filip, 2008). The primary hypothesis predicts if such an operator exists and is recruited, it will facilitate the realization of telic expressions. In the case that the null hypothesis is proven true the results can be interpreted as an indication of

default processing. One necessary note regarding this proposal, a psycholinguistic experiment investing the cognitive nature of aspect has never been attempted. The primary prediction is purely speculative as it is an attempt to extend linguistic theory to its psychological realization. The next section provides a detailed background of the working memory paradigm and provides a preliminary sketch of the design the current study will implement.

4 METHODOLOGY

4.1 BACKGROUND OF WORKING MEMORY

Working memory is a system which serves as a space for information to be temporarily stored or manipulated when undergoing complex cognitive tasks such as language comprehension. The concept was first proposed by Baddeley and Hitch (1974) who observed a decrease in performance rates for reasoning tasks when conducted simultaneously with a memory task. Consequently, this decrease became more pronounced as the cognitive demand for the reasoning task increased. This observation made clear that the processing and storing of incoming information shares a mutual cognitive system, coined the central executive. One of the three components of working memory, the central executive can maintain a limited capacity of information. This limitation is known as the processing-storage trade off. The phenomena where, when taxed with heavy memory loads, resources recruited for storage no longer remain available for processing and thus lower cognitive performance.

Naturally the model proposed by Baddeley and Hitch (1974) has evolved over the years, giving way to theories which argue the system's constraints to actively maintain information stems from the limited amount of cognitive resources that can be recruited. These resources include attention (Lovett, Reder & Lebiere, 1999), attentional control (Engle, Kane & Tholski, 1999) and limitations for the management of multi-system functioning (Baddeley & Hitch, 1994) among others. Although several theories exist describing which resources constrain the ability to process and store information within working memory, for the purposes of the experiment it does not matter which view you side with. Crucially, working memory has a specific threshold or capacity for the amount of information it can maintain. Once this threshold is exceeded certain pieces of information decay (Cowan, 2001; Lewandowsky, Oberauer & Brown, 2009) or are lost (Zhang & Luck, 2008, 2009, amoung others).

The Complex Span Task (CST) developed by Daneman and Carpenter (1980) is derived from the notion of resource sharing within working memory. Specifically the CST burdens working memory with additional information which forces the system to exceed threshold. Although several variations of this task have been created over the years, two fundamental parameters remain constant: a primary task consisting of a list of target words and a secondary or background task where a sentence or sequence is presented. Regardless of which variation of the CST is adopted, at some point in the procedure the participant is asked to recall as many target words from the primary task as they can and answer a question relating to the secondary task (verification, comprehension, judgement etc.).

The CST is an ideal paradigm to test the current research hypothesis as it is sensitive to detecting competition present in a system. Working memory has been used to investigate instances where multiple interpretations become available when ambiguity arises during reading

comprehension. Specifically research has been done investing the nature of lexical ambiguity produced by homographs (Gorfein, 1989; Miyake et al., 1994; Rosen, 1998) and lexical syntactic class ambiguities (MacDonald et al., 1992; Pearlmutter & MacDonald, 1995). In these instances, multiple candidates are activated and the parser must suppress one activation over another in order to come to the correct interpretation.

As the primary task in this paradigm is to strain cognitive resources, structures with competition involved will be harder to compute. It is predicted that telic sentences will thus be processed easier as MAX_E selects the largest unique candidate from an ordered set. However, atelic sentences should prove harder to process as no candidate is able to satisfy the operator, which leaves the interpretation ambiguous. The additional resources atelic expressions appear to require will not be available as they will be used instead for remembering the target word. Specifically, evidence reflecting the following will support the belief that aspect is a grammatically driven process which utilizes a scalar mechanism: low word recall and slow response times to the question relating to the secondary task for atelic expressions and high word recall along with fast response times for telic expressions.

4.2 STIMULI

One aspect this experiment takes away from lexical approaches is a template to categorize verb types. Since the MAX_E operator exclusively works with verbs compatible with scalar properties the current experiment adopts Rappaport's (2008) classification of verbs to use for its stimuli. The reason this classification is adopted over Vendler's is because Rappaport classifies verbs based on scalar properties.

A fundamental aspectual distinction noted by Rappaport (2008) is whether or not the verb denotes an event which involves change. As proposed by Dowty, a verb can be stative or dynamic with the latter involving the predicate to undergo a change which can only be judged true at an interval of time. Within the category of dynamic verbs lie two further distinctions: verbs denoting events of scalar change such as *warm*, *cool*, *ripen*, and those denoting non-scalar change, *exercise*, *laugh*, *rain*. Evidence further explaining the grammatical differences between these verb types are illustrated by Rappaport (2008) and Rappaport Hovav and Levin (2002, 2005).

Rappaport defines scalar verbs as those whose inherent lexical features denote a scale. In agreement with Filip, a scale reflects an ordered set of values for a particular attribute. Therefore Rappaport assumes a scalar change "involves an ordered set of changes in a particular direction of the values of the attribute" (Rappaport, 2008 pg. 17).

The stimuli being used for the current experiment recruits scalar, SINC and INC verbs, all of which are compatible with the MAX_E operator. Scalar verbs inherently denote either property or path scales. As defined by Rappaport, the former involves a physical change of the theme and a state change of the verb as in *lengthen*, *widen*, *dim* while the latter indicate a theme's change in position along a path as in *ascend*, *come*, *exit*. Crucially, SINC and INC verbs differ from scalar ones as it is the theme which provides the scale rather than the verb itself. Therefore these relations denote extent/volume scales such as in *eat an apple, create a sculpture*. An important point must be noted here. Since each verb type possesses slight lexical differences this may affect processing times.

The syntactic level MAX_E applies for scalar verbs is at the V level as the verb's inherent lexical properties elicit the scale. Incremental verbs require the combination of the verb and incremental theme in order to elicit a scale and so MAX_E applies instead at the VP level. The integration for processing incremental verbs predictably may require additional cognitive effort and thus reflect differing processing times over scalar verb constructions. To control for this, correlations between verb types for telic/ atelic constructions will be done to see whether a positive association exists.

The sentences themselves are constructed in minimal pairs such as: s*he cleaned the kitchen until it was spotless* (telic) and s*he cleaned the kitchen for a few minutes* (atelic). Traditionally minimal pairs are constructions which differ in only one phonological element and produce distinct meanings. Here, the minimal pairs differ in the adverbial phrase to render distinct aspectual readings. The manipulation of the adverb provides an explicit boundary for the operator to select the largest unique candidate along the scale. In this way, the minimal pairs ensure the clearest comparison of the MAX_E operator working on the two types of aspectual scalar constructions.

Finally, this experiment considers the lexical composition of aspect rather than its morphological make-up. The reason being is this experiment will be conducted on native speakers of English. As English is rather morphologically impoverished in the aspectual domain it follows that it is more ideal to turn to its lexical composition instead.

4.3 PROCEDURE

Before I present the tentative lay out for the experiment I must stress the following point. As mentioned previously, there currently exists no experimental evidence, to my knowledge, helping to distinguish between aspectual theories. Although the paradigm being adopted appears promising, it may prove problematic or not sensitive enough to correctly test the hypothesis. This is because the scalar process associated with aspect may not be as prevailing compared to scalar implicatures, and so the paradigm may not detect it. Therefore the procedure below is only a sketch. A pilot study will be conducted to see if it proves successful and therefore is subject to change.

Sentences will be divided into two groups based on telicity and presented in blocks of five sentences. The experimental design is a between-participant design, where a different pool of participants reading either telic or atelic constructions. As working memory tasks do not incorporate filler sentences, these measures will help control for practice and boredom effects.

The sentences will be presented at a comfortable time interval (approximately 200-300ms) word-by-word rather than self-paced. The target word will be presented sentence finally as illustrated in the example, *The ice melted four five minutes* ***ball***. After each sentence a yes/no question will be asked either relating to the aspectual content of the sentences or not followed by the recall of the memory words. The implementation of yes/no questions is another measure which prevents participants from adopting strategies to focus on memory words and helps distract attention away from the purpose of the experiment (Daneman & Carpenter, 1980). .

Two measures will be recorded during the experiment, the response time to the yes/no questions and how many memory words are recalled. As the sentences themselves are not self-paced, readings times will not be recorded. The reason being, increased processing times for

certain regions do not necessarily correlate with processing difficulty (Engle et al., 1992). The response times for the questions serve as an indication of how easily the participant comprehends what is being asked using minimal cognitive resources. If response times increase this will support the aspectual construction it corresponds with involves more cognitive effort. The same follows for how many memory words are recalled. An increase in word recall indicates fewer resources were required to compute and respond to the questions.

5 FUTURE DIRECTIONS

As the first experiment sets out to unearth if aspect is a grammatically driven phenomenon primarily facilitated by the MAX_E, the secondary experiment will seek to further support this hypothesis by providing neurological evidence. Specifically, the experiment will use electroencephalography (EEG) to record event-related potentials (ERPs), online processing signatures sensitive to various levels of language processing.

The EEG methodology reflects graphic representations of electrical brain activity. The fluctuations in electrical potentials are recorded by placing a cap covered in electrodes onto the scalp with a conductive gel (Rodden & Stemmer, 2008). Overall this methodology provides valuable insight to the unfolding of various linguistic processes in real-time as it has excellent temporal resolution.

Since language tasks such as comprehension often utilize several regions of the brain, thousands of signals are up while the EEG is recording. ERPs are *time locks* which reflect specific parts of an electric activity associated with a specific linguistic manipulation (Rodden & Stemmer, 2008). A specific ERP, the P600, is a positive waveform spiking approximately 500 to 1000ms (Osterhout & Holcomn, 1992). It is a hallmark response which reflects structural processing such as structural reanalysis as seen in garden path constructions (Osterhout & Holcomb, 1992; Mecklinger et al., 1995; Steinhauer et al., 1999 among others), morpho-syntactic violations (Coulson et al., 1998) as well as in complex sentences absent of violations or ambiguity (Kaan et al., 2000).

The stimuli used for the working memory task will also be implemented in this experiment. Recall that these sentences are not manipulated for any type of linguistic violation. Since the P600 serves as a marker for structural integration of congruent information (Kaan et al., 200; Lamb et al., in preparation) it is assumed this ERP will appear present for aspectual integration as well. Specifically, it is hypothesized that the P600 will be elicited at the V or VP. If this is illustrated it will serve as evidence supporting aspect as a local process where MAX_E facilitates realization at the VP/V level. If the P600 is not observed at this time lock and instead appears more delayed after the theme has been read, this will be interpreted as evidence supporting aspectual realization as a global phenomenon.

6 CONCLUSION

In conclusion, this paper presents an outline for a psycholinguistic experiment investing the cognitive nature of aspectual realization. Specifically the experiment seeks to inquire whether aspect is primarily derived via local (semantic) or global (pragmatic) processing. The core hypothesis being aspect is a grammatical phenomenon over-seen by the operator MAX_E. It is

predicted that the operator will facilitate telic expressions but not atelic ones. As the operator does not apply itself in these constructions, it leaves the interpretation ambiguous. In this case the system has no method of selecting the largest unique candidate amongst a set of possible value along a scale, it therefore must recover using other resources such as contextual information. This hypothesis will be tested using a working memory paradigm. If the results reflect evidence in favour that telic expressions are realization faster and more easily than atelic ones, the primary hypothesis will be supported. If however the results support the null hypothesis, the evidence will be interpreted as supporting atelicity as the default realization.

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