Multiple Exponence and Underspecification of Temporal Operators in the Afrikaans Verbal Complex

In our presentation of the Afrikaans past tense marking system we will argue that the data can best be described by means of scope underspecification and multiple exponence of temporal operators. We will account for these observations within *Lexical Resource Semantics* (Richter and Sailer, 2004).

Data In comparison to the verbal systems of related languages such as Dutch or English, Afrikaans verbal morphology is relatively simple. Basically, verbs have two forms: a temporally unmarked form and a form which is marked as past. For some modal verbs both forms are expressed with morphologically simple words (*wil* (*want*), *wou* (*wanted*)), for other verbs the unmarked form is simple, and the past form morphologically resembles the present perfect of Dutch or English (*koop* (*buy*), *gekoop het* (*bought*)).

As discussed in the literature (de Villiers, 1971; Ponelis, 1979; Donaldson, 1993; Kleij, 1999), the usage of these forms leads to systematic ambiguities. Sentence (1) illustrates this ambiguity. In (a)–(c) we indicate the three possible temporal readings,[1] first by an English translation and then by a logical expression. In the latter, we use the operator "^" to indicate intensional contexts, and the operator "PAST" to indicate a semantic past tense. For a possible interpretation of this operator, see e.g. Stechow (2002).

(1) Jan wou die boek gekoop het.
Jan want.PAST the boek bought have

a. Jan wanted to have bought the book. $\text{PAST}(\textsf{want}'(j, \hat{}\text{PAST}(\textsf{buy}'(j, \textsf{the-book}))))$

b. Jan wants to have bought the book. $\textsf{want}'(j, \hat{}\text{PAST}(\textsf{buy}'(j, \textsf{the-book})))$

c. Jan wanted to buy the book. $\text{PAST}(\textsf{want}'(j, \hat{}\textsf{buy}'(j, \textsf{the-book})))$

Sentence (1) contains two morphological past markings: the verb *wou*, and the complex *gekoop het*. There is at least one past tense operator in each reading. The three readings, then, differ with respect to the number of past operators and with respect to the scope. In (a) there occur two past operators, one for each verb. In (b) only the embedded verb is interpreted as past. In (c) the past operator has scope over the modal verb.

Notably in the (b)-reading, although the modal verb is marked as past, it is not in the scope of a past operator. We also find instances of a verb that is not marked for past, but interpreted as past. In (2) from Kleij (1999) the form *moet* (*must*) is used instead of the past form *moes*. Nonetheless, the indicated reading exists.

(2) Ek moet los kon rondgeloop het. 'I had to be able to run around freely.'
I must freely can.PAST around.walked have $\text{PAST}(\textsf{must}'(\hat{}\ \textsf{can}'(i, \hat{}\ \textsf{run-around-freely}'(i))))$

To demonstrate that both the modal verb and the embedded verb can contribute a past operator, consider (3). Both sentences are ambiguous, allowing the possibility of both a (b)- and a (c)-reading, however the (a)-reading is excluded.

(3) a. Jan wou die boek koop.

b. Jan wil die boek gekoop het.

With these data we argue that every verb which is marked for past tense contributes a past operator to the logical form. Nonetheless, the scope of this operator is not determined by the position in which it is introduced in the syntax. To account for the (b)- and (c)-readings of (1), a mechanism is needed which allows the interpretation of only one of the two past operators.

[1] In addition to the past tense use, *wou* and *gekoop het* can also be irrealis. Thus the readings *Jan would love to have bought the book.*, and *Jan would love to buy the book.* are possible. We will ignore these modal readings in this paper.

Lexical Resource Semantics The observations presented above are not easily accommodated with a simple view of compositionality. Therefore, we will provide an analysis within the framework of *Lexical Resource Semantics* (LRS, Richter and Sailer (2004)). LRS uses techniques of underspecified semantics (Reyle, 1993; Bos, 1996). With this kind of approach, the semantic representation of a sentence is not a single expression but a set of expressions, which will ultimately form the overall logical form of a sentence. What makes these systems underspecified is that the subexpression relations between these expressions is constrained by the syntactic constellations, but not fully resolved by the principles of grammar. This allows for a lean representation of scope ambiguities.

Bouma (2003) uses LRS for an account of scope ambiguities. Instances of multiple exponence of a semantic operator, in particular negation. are discussed in Richter and Sailer (2001) According to their analysis, several words in a clause may contribute a negation operator to the overall logical form, but language-specific principles ensure that all these operators are identical. Our exploration of the data reveals that an analysis of Afrikaans past tense marking must account for these two phenomena: underspecification and multiple exponence. This makes LRS particularly apt for our enterprise.

Just as in the underspecification literature, in LRS the logical form of a sentence consists of the set of subexpressions of the resulting reading. For the (a)-reading of (1), the logical representation of the clause is the set in (4).

(4) $\left\{ \begin{array}{l} j, \textsf{the-book}, \textsf{buy}'(j, \textsf{the-book}), \textsc{past}(\textsf{buy}'(j, \textsf{the-book})), \hat{}\textsc{past}(\textsf{buy}'(j, \textsf{the-book})), \\ \textsf{want}'(j, \hat{}\textsc{past}(\textsf{buy}'(j, \textsf{the-book}))), \textsc{past}(\textsf{want}'(j, \hat{}\textsc{past}(\textsf{buy}'(j, \textsf{the-book})))) \end{array} \right\}$

In (5), we indicate the elements of the set mentioned above according to the words which contribute these elements. We use Greek letters as meta-variables for expressions which are not directly contributed by the indicated word.

(5)

Jan: j	*wou*: $\textsc{past}(\alpha)$, $\textsf{want}'(j, \hat{}\beta)$, $\hat{}\beta$	*het*: $\textsc{past}(\gamma)$
die boek: the-book	*gekoop*: $\textsf{buy}'(j, \textsf{the-book})$	

In (5) we indicated the logical expressions which constitute the semantic contributions of the words in sentence (1). The syntactic relations between the words enforce the argument identification and ensure that the expression $\textsf{buy}'(j, \textsf{the-book})$ is a subexpression of β.

If all the meta-variables in (5) refer to distinct elements of the set, we obtain the (a)-reading. It is an important innovation of LRS to allow several lexical elements in a clause to contribute the same semantic operator. For our example, this means that we can assume identity of the past operators contributed by *wou* and *het*. This identity leads to two possible scopings, one in which $\alpha = \gamma = \textsf{buy}'(\ldots)$, i.e., the (b)-reading; and another in which $\alpha = \gamma = \textsf{want}'(\ldots)$, i.e., the (c)-reading.

In the paper we will use more sophisticated semantic representations along the lines of Stechow (2002), which include event and time variables. We will demonstrate that readings such as those in (6) can be correctly excluded with these representations.

(6) a. $\textsc{past}(\textsc{past}(\textsf{want}'(j, \hat{}\textsf{buy}'(j, \textsf{the-book}))))$ b. $\textsf{want}'(j, \hat{}\textsc{past}(\textsc{past}(\textsf{buy}'(j, \textsf{the-book}))))$

We will also demonstrate that the type of temporal concord illustrated is specific to the verbal complex and differs from other temporal concord patterns found in Afrikaans. In particular, an embedded PAST operator cannot have scope over a matrix verb in sequence of tense constellations. This contrasts with the reading of (2) where an embedded past could outscope a syntactically higher verb.

(7) Jan sê dat Maria vertrek het. $\textsf{say}'(j, \hat{}\textsc{past}(\textsf{leave}'(m)))$
Jan says that Maria left AUX * $\textsc{past}(\textsf{say}'(j, \hat{}\ \textsf{leave}'(m)))$

Conclusion The system of past tense marking in Afrikaans provides empirical evidence for the need for scope underspecification and multiple exponence of semantic operators within the system of combinatorial semantics. Since LRS incorporates these two features, it allows for a straightforward analysis of the data.

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