

Attributive Clauses in Chinese: Theory and Implementation

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Abstract

This paper concerns attributive clauses in Mandarin Chinese - ie. clauses which assign properties to some entity. It identifies the semantic and grammatical range of these clause types, providing a network representation of their paradigmatic relatedness. This network provides the semantic basis for the generation of feature clusters which - via realisation rules and potential structures - output the target clauses.

1. Introduction

In this paper we present a lexicogrammar of attributive clauses in Chinese. The theory adopted is Systemic Functional Grammar (SFG), according to which grammar is a set of choices in meaning, which can be arranged in the form of system networks, mediating the various functions that language serves (Halliday 1985, Fawcett 1987).

2. Types of Participant Roles in Attributive Clauses

Attributive clauses represent relationships involving an entity and some other entity which might be a thing or quality. They realise processes which assign an attribute, one of the participant roles associated with the process, to another participant role, 'Carrier', where 'process' refers to actions, events, states and relations (Halliday 1970:146). Processes are defined in terms of Participant Roles (PRs) and their configurations. Four PRs are relevant to this part of the grammar: Carrier (thing that displays a property), Attribute (property displayed), Agent (doer, actor) and Affected (patient, goal). Tests have been developed for these roles, but it is beyond scope of this work to discuss them (see Zhou in preparation).

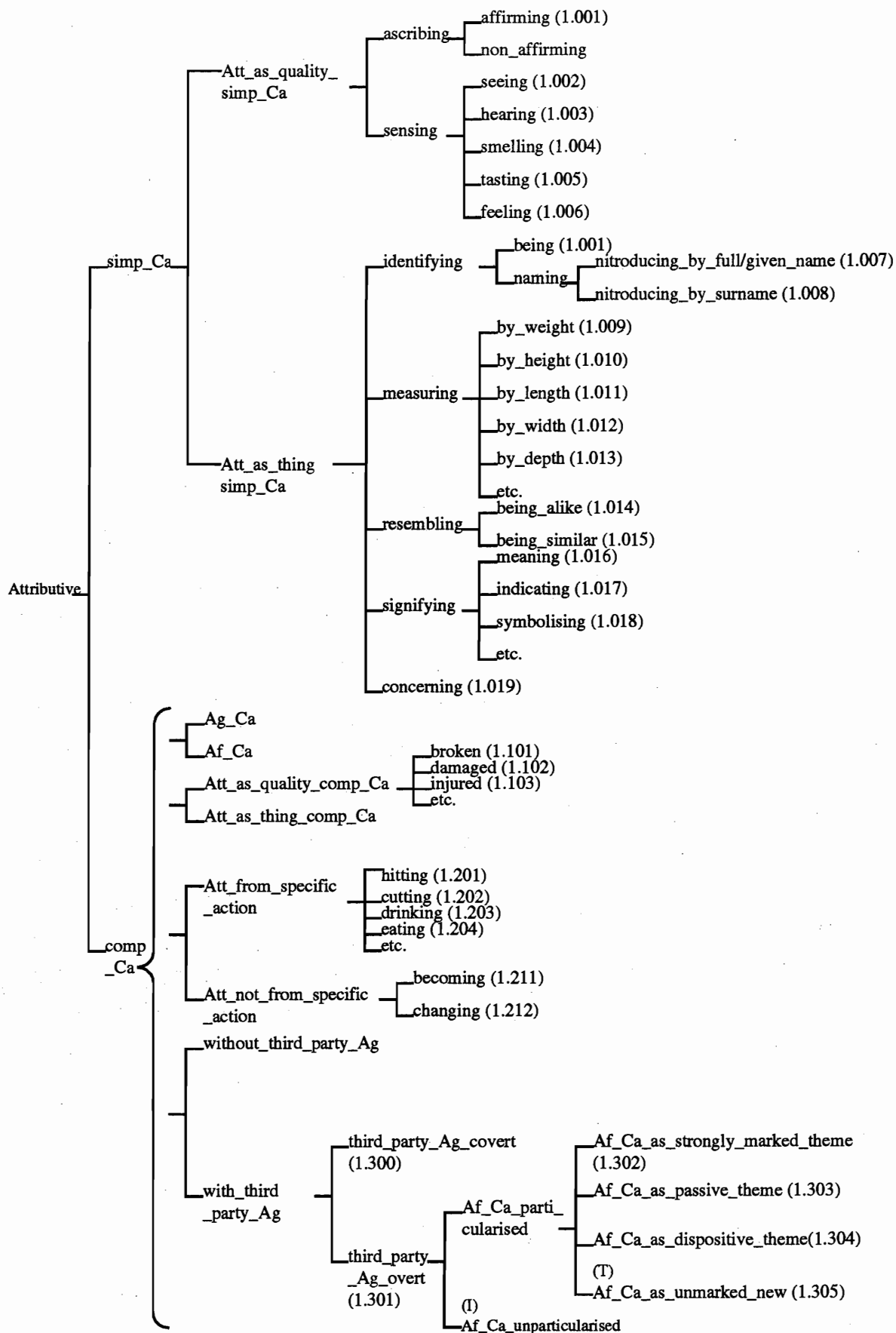


Fig. 1 A System Network for Attributive Clauses in Chinese

3. Network Representation of Attributive Clauses in Chinese

Figure 1 is a network representation of attributive clauses in Chinese. Observe that a primary distinction is made between 'simple Carrier attributive' and 'compound Carrier attributive' process types, according to whether the role of Carrier is conflated with the Agent or Affected. For detailed discussion of the various oppositions in the network (see Zhou in preparation).

4. Implementation

The implementation is based on the sentence generator developed in the COMMUNAL Project at the University of Wales, Cardiff, UK (see Fawcett, Tucker and Lin (1993) and Lin, Fawcett and Davies (1993)).

The implementation requires two things in addition to the network: potential structures and realisation rules. Potential structures characterise grammatical units in terms of the range of possible items that constitute them, and their order; they provide order-class characterisations. A simplified potential structure of a Chinese clause relevant to attributive processes is (elements which can occur in more than one places, such Complement, are not specified in the potential structure - they are specified by the relevant realisation rules):

unit ('Cl') : S @ 10, Atp @ 11, Xcon @ 19, M @ 23, Cr @ 26, Xperf @ 28¹

There are five major types of realisation rule in the grammar:

1. **Unit insertion rules**, which add a syntactic unit to the existing sentence structure. For example, if one selects the feature [situation] in the network, the unit 'Clause' will be generated. The realisation rule which does this is:

1 : situation : 'Cl'.

2. **Component rules**, which add elements into the potential structure, and put them in their correct places. For example, the features [Af_Ca_unmarked_new] and [Af_Ca_dispositive_Theme] are associated with realisation rules as follows:

¹Key to symbols: Z = sentence, Cl = Clause, S = Subject, Atp = Time-position Adjunct, Xcon = Aspect:Continuous, M = Main Verb, Cr = Resultative Complement, Xperf = Aspect:perfective, C = Complement, Ag = Agent, Af = Affected, Ca = Carrier, ngp = nominal group, mrgp = minimal relationship with thing group (prepositional group), qlgp = quality group, cv = completeive.

1.305 : Af_Ca_unmarked_new :
 'C2' @ 32,
 'Af_Ca' by 'C2',
 for 'Af_Ca' prefer [thing],
 for 'Af_Ca' re_enter_at entity.

1.304 : Af_Ca_dispositive_Theme :
 'C2' @ 22,
 if attribute_as_thing then,
 for 'C2' prefer [thing, minimal_relationship_with_thing, dispositive_marker],
 for 'C2' re_enter_at entity.

Rule 1.305 puts 'C2' (Second complement = direct object) at place 32, which is after the Main Verb, whereas rule 1.304 puts it at place 22, ie. before the Main Verb.

3. **Conflation rules** place PRs (such as a Carrier) by elements, e.g. 'Ca' by 'S', or 'Af_Ca' by 'C2' (see rule 1.305 above). Thus participant roles are present in the structural output from the generator.

4. **Exponence rules** state that an element is expounded by a lexical item. For example, M <"da"> says that the main verb is expounded by the word "da" 'hit'. Intonation can also be generated by exponence rules.

5. **Re-entry rules** make it possible for the generator to traverse a network a second time. For example, rule 1.305 has a re-entry rule as a part, which says that to generate the content of 'C2' we must re-enter the network (and make more choices).

5. An Example: Generating a Compound-Carrier Attributive Clause

The target clause is *Wo ba beizi da po le* 'I broke the mug'. To generate this clause, the following choices are made: [comp_Carrier_attributive], [Affected_Carrier], [Attribute_as_quality_comp_Carrier], [Attribute_from_specific_action], [hitting], [broken], [with_third_party_Agent], [third_party_Agent_overt], [Affected_Carrier_particularised], [Affected_Carrier_as_dispositive_theme]. The realisation rules attached to the relevant features are next applied, building the following structure after the first pass:

ZICl -> S/Ag
 -> C
 -> M < "da"
 -> Cr
 -> Xperf < "le"

After the second pass, the following structure is generated, giving the target clause as output:
wo ba beizi da po le 'I broke the cup' (Due to space limitation, details have been glossed over):

ZICl -> S/AgIngp -> h < "wo"
 -> CImrgp -> mr1 < "ba"
 -> cvIngp -> h < "beizi"
 -> M < "da"
 -> CrIqlgp -> a < "po"
 -> Xperf < "le"

6. Conclusion

This paper has provided an SFG description of attributive clauses in Mandarin Chinese. SFG offers a rich framework for describing and analysing various clause types and provides an understanding of their richness as well as a means of generating clauses from a system network. We have been able to identify a range of clause types which otherwise remain obscure. This investigation has shown that SFG offers a useful and insightful set of strategies for computational linguistics.

References

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