

RETHINKING THEME AND RHEME:
SOME INDICATIONS FROM A RESPONDENT STUDY¹

ALVIN PING LEONG

National University of Singapore

1. Introduction

This paper presents the findings of an exploratory respondent study to do with the notions of theme and rheme, and discusses how these findings help us to understand these notions from an alternative perspective. The study takes, as its starting point, the Hallidayan conception of theme as a position-bound, clause-initial element and rheme as the development of theme (Halliday 1985: 38-67, 1994: 37-67). It approaches the theme-rheme notions from a language-processing standpoint and is centrally concerned with the notion of *acceptability*, interpreted widely in terms of a language user's perception of reality or a particular worldview. This represents a point of departure from the Hallidayan framework as it has never been Halliday's intention to account for the acceptability of linguistic constructions. It is felt, however, that insofar as theme and rheme organise the clause as a message (Halliday 1994: 37), such an approach could serve as a useful way to understand the functional roles of these notions.

Based on the findings of the study, an *inference boundary model* is proposed as a complementary, rather than competing, account to the Hallidayan framework. This model views theme as a clause-initial portion that is capable of generating a boundary of acceptability within which it is permissible for the rheme to occur. Underlying the theme-rheme structure of the clause is a principle dic-

¹ This is a revised version of a paper presented during the 26th International Systemic Functional Congress held in Singapore from 26 to 30 July 1999.

tating that the theme of a clause must be acceptably developed by the rheme. The primary function of theme, therefore, is not simply to introduce the rheme, but to do so within this boundary of acceptability so that the clause makes sense only if both its theme and rheme are considered together.

2. Focus of study

The theme-rheme notions, first extensively used by the Prague school linguists, may be attributed to the work of Weil who, in his thesis of 1844, made the following observation:

There is ... a point of departure, an initial notion which is equally present to him who speaks and to him who hears, which forms, as it were, the ground upon which the two intelligences meet; and another part of discourse which forms the statement (*l'énonciation*), properly so called. This division is found in almost all we say (Weil 1844: 29).

Today, this division – what Weil calls *point of departure* and *enunciation* – has diverse interpretations and is termed variously as *topic-comment* (Dahl 1974a, 1974b; Sgall 1974, 1975; Dezsö – Szépe 1974a, 1974b; Bates 1976; Sgall – Hajičová 1977), *topic-focus* (Hajičová 1994; Lambrecht 1994; Peregrin 1996; Koptová 1996), *topic-dominance* (Erteschik-Shir 1988), or *theme-rheme*.

In this paper, we shall use the theme-rheme notions and build upon the Hallidayan conception of theme as a position-bound element and rheme as the development of theme. Although adopting the Prague school terminology,

Figure 1: Textual, interpersonal, and topical themes (after Halliday 1994: 54).

Textual Theme	Continuatives Conjunctions or wh- relatives Conjunctive adjuncts
Interpersonal Theme	Vocatives Modal adjuncts Finite operators Wh- (content interrogatives)
Topical Theme	Participant, circumstance, or process

Halliday departs from the general approach of Firbas (1975, 1986, 1987, 1992) and others in two major respects. First, the simple theme-rheme division is adopted rather than the multiple divisions of *theme*, *theme-proper*, *diatheme*, *transition*, *transition-proper*, *rheme*, and *rheme-proper*. Specifically, “one element in the clause is enunciated as the theme; this then combines with the remainder so that the two parts together constitute a message” (Halliday 1994: 37). Second, whereas Firbas and others define theme in terms of communicative dynamism, Halliday regards it as a notion of initialness that is delimited by way of the metafunctional categories of his systemic-functional grammar – as textual, interpersonal, or topical theme. The clause-initial elements that realise such themes are listed in Figure 1.

The topical theme, the most important of the three theme types, comprises only one experiential element – the first occurrence of a participant, process, or circumstantial element – and ends the thematic portion of the clause. Halliday (1994: 53) argues that unless this constituent appears, “the clause still lacks an anchorage in the realm of experience.” The thematic portion, therefore, extends from the beginning of the clause up to and including the topical theme. The topical theme need not be preceded by textual or interpersonal themes which are optional. If all three themes do appear, however, they typically follow the textual-interpersonal-topical order, as illustrated in Figure 2.

Figure 2. Order of textual, interpersonal, and topical themes.

<i>On the other hand,</i>	<i>perhaps</i>
Textual Theme (conjunctive adjunct)	Interpersonal Theme (modal adjunct)
<i>you</i>	<i>might want to visit us next week.</i>
Topical Theme (participant)	Rheme

In the main, theme-rheme studies based on the Hallidayan framework are undertaken from a text-based or lexicogrammatical angle. Insofar as the thematic structure of the clause organises it as a message, another useful direction in theme-rheme research (albeit a less travelled one) is an investigation of how clausal messages are typically processed by language users. The present study has three broad aims:

- (a) It seeks to better understand the perceptions of language users on the acceptability of various constructions. The judgements of the respondents serve as an indication on their awareness that messages can be developed in certain ways but not others.
- (b) It seeks to find out if the odd constructions that are used in the study can be uniformly repaired. If this is possible, it provides another indication that the clause has an accepted message structure which facilitates the development of a well-formed message.
- (c) From close observation and the written inputs of the respondents, the study also hopes to gain an understanding of how language users typically make sense of the message within the clause and why, in particular, they feel that certain constructions are ill-formed.

We shall take note of three points as regards the general approach of the study. The first concerns the notion of acceptability. As remarked, acceptability is interpreted widely in terms of our perception of reality or a particular worldview, and extends beyond semantic acceptability. Consider, for example, the following (unacceptable clauses are prefixed with *; questionable clauses are marked with ?):

- (1) *John kicked the ball.* (acceptable)
- (2) **John laid an egg.* (unacceptable)
- (3) *?The machine turned itself on.* (questionable)
- (4) *The pane the ball John kicked hit broke.* (difficult to comprehend)

Since the (un)acceptability of linguistic constructions is not a key consideration in the Hallidayan framework, it cannot be used to clarify whether a particular clause is well-formed or otherwise. It is possible, for that matter, for a thematic analysis to be performed on clauses such as (2) where *John* is the topical theme. I wish to say, however, that this should be resisted, for if unacceptable clauses are also deemed to have a thematic (and therefore message) structure, the functional roles of theme and rheme would be obscured. To explain the (un)acceptability of clauses from a theme-rheme standpoint, therefore, we will need to complement the Hallidayan framework with an additional apparatus.

The second point concerns the use of unacceptable constructions in the study. It is felt that the role and function of theme, as a facilitator of message development within the clause, can be productively explored by erecting barriers to frustrate this facilitation. For this reason, ill-formed constructions are employed since they offer a different way of looking at the message structure of the clause and (typically) force us to examine it more closely. It is hoped that the use of ill-formed constructions will help to shed some light on the characteristics of the theme-rheme structure of the English clause.

The third point concerns the elicitation of respondent inputs or protocols. It might be objected that this method lacks the rigour and precision of *true* experimental work. This objection is a valid one and it is important to state here the reasons for selecting the interview-session approach over other alternative approaches favouring simple response measures, such as reading times, priming latencies, and so on. Three reasons are offered:

- (a) As opposed to simple response measures, Graesser and Clark (1985: 9) have remarked that "rich patterns in verbal protocols are more informative than simple response measures; a handful of latencies is a rather depleted data base compared to a large set of structured descriptions." Protocol analyses, in fact, have been used and defended by a number of researchers in various studies on both language processing and writing (Flower – Hayes 1981; Brown – Day 1983; Graesser – Clark 1985; Raimes 1985; Flower 1988; Doheny-Farina 1989). Although non-quantitative in nature, protocols provide rich patterns of information that offer insights into the mental processes of language users.
- (b) The focus of the study is on understanding decoder perceptions and acceptability judgements. The danger in reducing respondent inputs to a quantifiable, finite set is that of compromise – it forces the individual to fit his or her response to a closely-matching option. Needless to say, unless we have at our disposal a satisfactory way of clearly delineating and classifying all shades of human experiences, protocols still offer us a good data source for investigative and theoretical purposes.
- (c) Third, the preponderance of studies on inferences – a type of mental process – using simple response measures have not yielded any conclusive, definite answers (Kintsch 1993: 193). In part, this could be due to the restrictive nature of such studies which is, perhaps, reason enough to consider protocols as an alternative means of data collection. As Graesser and Clark note:

The ... reason for turning to complex verbal protocols reflects the level of complexity of available models of comprehension. The existing models are complex. There are several knowledge structures, detailed symbolic procedures, and complex interactions among components. The data collected in most available studies with simple response measures are not commensurate to the level of complexity in existing models. Complex verbal protocols may be more suited to the complexity of existing models (Graesser – Clark 1985: 13).

3. Respondents

The present study was carried out over a five-day period from 16 to 20 March 1998, involving one second-year and nine third-year undergraduates from the Department of English Language and Literature of the National University of Singapore. The respondents, who had volunteered for the study, comprised four males and six females, all of whom were between 20 and 25 years of age.

4. Design of study

Each respondent was observed over a 45-minute session comprising two parts (hereafter Part I and Part II), excluding the introductory session where they were asked to provide brief details about themselves and their familiarity with systemic-functional grammar. To familiarise the respondents with the procedure, trial runs for Parts I and II were conducted prior to the actual exercise. Although they were told that the exercise should take them no more than 45 minutes to complete, the respondents were not placed under any pressure to complete the booklet within that time frame.

In Part I, the respondents were presented with 18 clauses in a bit-by-bit fashion, as follows (normal context was assumed for all clauses):

- (5) *There ... is ... a need ... for us ... to be ... more courteous and kind.*
- (6) *What happened during dinner ... was ... my fault.*
- (7) **Fry ... the house.*
- (8) **When ... can ... he ... do?*
- (9) *What easy questions ... these ... are!*
- (10) *It ... was ... the report ... that ... irritated ... him.*
- (11) **Can ... the guitar ... complete ... the last lap ... in butterfly stroke?*
- (12) *It ... is ... a pleasure ... to work ... with you.*
- (13) **How handsomely ... he ... cooks!*
- (14) **What the bird laid ... was ... a pizza.*
- (15) *Is ... it ... convenient ... for you ... to come ... next week?*
- (16) **It ... is ... a sin ... to see ... children and babies ... happy.*
- (17) *Come ... here ... now!*
- (18) **The bird ... played ... soccer ... last night.*
- (19) *On Thursday, ... the index ... rose ... to an all-time high.*
- (20) **It ... was ... the umbrella ... that ... praised ... him.*
- (21) *Why ... didn't ... he ... deny ... those charges?*
- (22) **There ... was ... a power failure ... that ... graded ... his year-end examinations.*

Each component part of the clause, as divided above, was written on a small rectangular card. The cards were presented to the respondents one at a time with the instruction that they were to complete the clause as quickly as possible based

on the clausal element(s) that had been shown to them. This is illustrated below for clause (5):

- | | | |
|--------|---|---|
| (5) a. | After <i>There</i> | <i>There is a cat.</i> |
| b. | After <i>There is</i> | <i>There is a cat. (unchanged)</i> |
| c. | After <i>There is a need</i> | <i>There is a need to improve our performance.</i> |
| d. | After <i>There is a need for us</i> | <i>There is a need for us to improve our performance.</i> |
| e. | After <i>There is a need for us to be</i> | <i>There is a need for us to be healthy</i> |

The respondents were told that they could cease the clause-completion task if they felt that it was no longer possible for them to continue. After the entire clause had been presented to them, the respondents were next asked to assess if it was acceptable or odd, assuming normal context. If they felt that the clause was odd, they were further asked to state the reason for the oddness and to correct the clause by replacing the first replaceable word or group of words from the beginning of the clause.

In Part II, the respondents were presented with 24 clause-initial elements, representing different (combinations of) theme types under Halliday's framework, as follows:

- (23) *The little boy ...*
- (24) *At three o'clock ...*
- (25) *In all likelihood ...*
- (26) *What John gave my mother ...*
- (27) *But ...*
- (28) *How ...*
- (29) *Can the man ...*
- (30) *However, ...*
- (31) *It was the car ...*
- (32) *Is ...*
- (33) *The burning of the forests ...*
- (34) *Fortunately, ...*
- (35) *Was the lecture ...*
- (36) *Will ...*
- (37) *Why ...*
- (38) *Admittedly, ...*
- (39) *There ...*

- (40) *Which house ...*
- (41) *Come ...*
- (42) *It was my misfortune ...*
- (43) *Walk ...*
- (44) *And ...*
- (45) *In conclusion, ...*
- (46) *Well, John, ...*

The respondents were asked to construct nonsense clauses based on the initial elements presented to them. Normal context, again, was assumed for all cases. In the event that they were unable to do so, they were further asked to explain, in their own words, the reason why.

5. Findings

5.1. Part I

In general, the respondents faced little difficulty in this part of the study. Based on their inputs, two points of interest may be noted (for ease of reference, each respondent is assigned a number prefixed with the letter R – e.g., R1, R2, etc.).

The first concerns the respondents' expectations on clause structure. For example:

- (a) Consistently, the verb *be* was used after the initial prompts in (5), (6), (10), (12), (16), (20), and (22):
 - (47) *It is a hot day today.* [R3; on (10)]
 - (48) *There is something wrong with the TV.* [R8; on (22)]
- (b) The *that*-clause was used following the complement prompts for cleft constructions in (10) and (20):
 - (49) *It was the report that got him in trouble.* [R2; on (10)]
 - (50) *It was the umbrella that kept us dry.* [R6; on (20)]
- (c) Segments introduced by non-finite verbs were used to complete the complement prompts for extraposed-subject constructions in (12) and (16):
 - (51) *It is a pleasure to do this.* [R10; on (12)]
 - (52) *It is a sin to lie.* [R1, R3, R6, and R10; on (16)]

The only exception was the following in (53):

- (53) *It is a sin to him.* [R7; on (16)]

Used this way, however, (53) is not expressed as an extraposed-subject construction but one where the grammatical subject has semantic content.

- (d) The initial finite operators in (11) and (15) were followed by nominal elements – such as *you* and *he*:
 - (54) *Can you buy me an ice cream?* [R5; on (11)]
 - (55) *Is he good?* [R6; on (15)]
- (e) In the pseudo-cleft constructions in (9) and (14), only adjectives or nominal groups were used after the predicator:
 - (56) *What happened during dinner was weird.* [R1; on (9)]
 - (57) *What the bird laid was an egg.* [R1 and R5; on (14)]

However, in two cases, the respondents' expectations were less regular and, in the case of exclamatives, resulted in a construction that was structurally odd.

- (a) The *wh*-elements in the exclamatives (9) and (13) were treated by some respondents as initiators of a content interrogative:
 - (58) **What easy questions the teacher is asking?* [R3; on (9)]
 - (59) *How wonderfully can one be rewarded?* [R1; on (13)]
- (b) The *when* prompt in (8) was regarded by some as part of a subordinate clause:
 - (60) *When it rains, tell me.* [R7; on (8)]

Yet, in both cases above, when the respective second elements were presented – a nominal group in (9) and (13), and a modal auxiliary in (8) – the respondents' expectations on the structure of the unfolding clause became more uniform.

The second point of interest moves away from such structural issues to the respondents' expectations on how the message would likely be developed. After *Fry* in (7), for example, only edible items were named with one odd exception (due possibly to a misreading of *fry* for *fire*, meaning *to sack*):

- (61) **Fry me.* [R2; on (7)]

Such prototypical associations were also made by the respondents for other prompts.

- (a) In (13), *rewards* and *dressing* were favoured after *How handsomely*.
- (b) In (14), only *eggs* was mentioned or implied after *What the bird laid*.
- (c) In (16), *lying* (four instances) and *stealing* (two instances) came after *It is a sin*.
- (d) In (18), *playing* did not appear to be an act prototypically associated with birds. Two respondents stopped the completion task after the verb *played*.
- (e) In (11) four respondents indicated that they could no longer continue with the clause-completion task after the verb *complete* was shown to them. Apparently, they were not used to the verb being associated with guitars.

When *the last lap* was next presented, another four respondents indicated that they, too, were unable to carry on with the clause-completion task. As for the remaining two respondents who nevertheless managed to complete the clause with this prompt, their constructions were odd in that *lap* was used inappropriately as a partitive for a *jamming session* and *musical score*:

- (62) **Can the guitar complete the last lap of the jamming session?* [R2; on (11)]
 (63) **Can the guitar complete the last lap of the musical score?* [R5; on (11)]

We turn now to the repair of the odd constructions. As illustrated in the table, the respondents amended the odd constructions in a uniform way by replacing identical elements in each. The replaced items are typically topical themes; the exceptions involve existential, cleft, and extraposed-subject constructions where the nominal group following the predicator, rather than the empty subject, is replaced. In the Hallidayan framework, the empty subject in such constructions (unless preceded by a circumstantial adjunct) is analysed as the topical theme. From a message development standpoint, however, it is difficult to see how this could be so. As a semantically empty element, the subject has no representational function in transitivity and is, by definition, incapable of serving as an anchorage for the clausal message (Halliday 1994: 53, 142-144). Settling for the first element with a transitivity function does not appear to be an adequate solution either (see Thompson 1996: 138) since none of the respondents replaced the *be* verb.

Table 1. Repair of odd constructions.

<i>Odd clauses</i>	<i>Replaced elements</i>
(7) * <i>Fry the house.</i>	The instructional verb <i>Fry</i> was replaced: (64) <i>Paint the house.</i> [R3, R4, R5, R6, and R10]
(8) * <i>When can he do?</i>	The wh-element was replaced: (65) <i>What can he do?</i> [all, except R2]
(11) * <i>Can the guitar complete the last lap in butterfly stroke?</i>	The nominal group <i>the guitar</i> was replaced: (66) <i>Can John complete the last lap in butterfly stroke?</i> [R2, R3, R4, and R5]
(13) * <i>How handsomely he cooks!</i>	Part of the wh-element was replaced: (67) <i>How well he cooks!</i> [R2, R3, R5, R8, and R9]

<i>Odd clauses</i>	<i>Replaced elements</i>
(14) * <i>What the bird laid was a pizza.</i>	Part of the grammatical subject was replaced: (68) <i>What the woman baked was a pizza.</i> [R4]
(16) * <i>It is a sin to see children and babies happy.</i>	The nominal group <i>a sin</i> was replaced: (69) <i>It is a joy to see children and babies happy.</i> [R1, R3, R6, R7, R8, and R9]
(18) * <i>The bird played soccer last night.</i>	The nominal group <i>The bird</i> was replaced: (70) <i>The boy played soccer last night.</i> [R1 and R4]
(20) * <i>It was the umbrella that praised him.</i>	The nominal group <i>the umbrella</i> was replaced: (71) <i>It was the teacher that praised him.</i> [R1, R3, R5, R8, and R10]
(22) * <i>There was a power failure that graded his year-end examinations.</i>	The nominal group <i>a power failure</i> was replaced: (72) <i>There was a teacher that graded his year-end examinations.</i> [R7 and R8]

The explanations offered by the respondents on why they felt that the constructions were odd further provided a useful hint on the bridging strategy in language processing. The explanations suggest that the entire clause is taken into account when a decision on its acceptability is called for. Although this might appear to be self-evident, thematic studies have tended to marginalise the rhematic element rather than consider the clause in its entirety as a bearer of some message. The following inputs by the respondents reveal that the initial part of the clause must be adequately and appropriately developed by what follows it:

'The house' is not an object that can be fried. [R10; on (7)]

'Guitar' [is] inanimate, therefore [it] cannot swim, let alone any kind of stroke. [R9; on (11)]

Happiness is usually something beneficial to human beings. Hence the oddity lies in saying that is a sin. Also, we would usually want the best for children and babies so if they're happy, that would be good. [R8; on (16)]

Power failures are incapable of grading examinations. [R3; on (22)]

5.2. Part II

The respondents' nonsense clauses in Part II reveal two things about the function of clause-initial elements in facilitating the development of the clausal message. First, in prompts typically analysed as textual connectors or having some interpersonal function as vocatives, finite operators, or modal adjuncts, the oddness of the ill-formed clauses formed by the respondents is due entirely to the second portion alone (no textual context was offered for the textual connector prompts – the respondents were told to imagine an appropriate situation where the prompts could be used). That is to say, these initial-position textual connectors or interpersonal markers do not seem strong enough to constrain how the message will ultimately develop within the clause:

(73) **However, the pupils cooked the fan.* [R1; on (30)]

(74) **Fortunately, the moon saved him.* [R7; on (34)]

(75) **Will the table come here now?* [R8; on (36)]

Second, from the respondents' contributions, the elements that are able to sufficiently constrain how the message will develop appear to be those that correspond closely to Halliday's process, participant, and circumstantial elements:

(76) **At three o'clock, it was 4 in the morning.* [R6; on (24)]

(77) **The burning of the forests made us lamb chops for dinner.* [R5; on (33)]

(78) **Which house talked nonsense?* [R7; on (40)]

In particular, circumstantial elements – such as *At three o'clock* in (76) – are unlike modal adjuncts, since they specify an environment of time, location, or manner that permits the occurrence of certain events but not others. Although the initial adjunct in (76) is not obligatory, it clearly functions in a different way from modal adjuncts. Often, what differentiates circumstantial adjuncts or elements from modal adjuncts is a matter of opinion or perspective. Modal adjuncts generally open up a world of near-infinite possibilities. This makes them a non-specific starting point for a message since what is certain, possible, likely, and so on, varies from person to person. Circumstantial adjuncts or elements, on the other hand, are more specific. Although various occurrences are permitted to occur, say, at three o'clock, there is also a range of other occurrences that are not permissible at such a time. For the very reason that it is possible for it to be unacceptably continued by the following segment, circumstantial elements possess the constraining capacity to direct how a message should proceed.

Where content interrogatives are concerned, (79a) and (80a) provide some indication on the syntactic considerations that enter into the construction of content interrogatives:

(79) a. **How/Why/When/Where can John give?*

(80) a. **What can John arrive?*

In (79a), the manner, reason, temporal and locative elements are clearly incompatible with the following segment since the verbal element is transitive:

(79) b. **John can give in a hurry.*

c. **John can give because of his skill.*

d. **John can give tomorrow.*

e. **John can give in Singapore.*

In the same way, the wh-element in (80a) is inappropriate since it is usually the case that one arrives somewhere rather than something:

(80) b. **John can arrive the book.*

6. Summary of main findings

From the above discussion, we may make four points about the main findings of the study.

- (a) Generally, assessing whether the clausal message has been acceptably developed from some starting point is not a difficult task. In cases when this development breaks down, it is possible to repair the odd construction by isolating and replacing some element situated near or at the initial position of the clause. It is suggested that these elements correspond closely to the topical theme of Halliday's framework. But the Hallidayan account of the theme of existential, cleft, and extraposed-subject constructions may need to be re-examined.
- (b) The inputs in Part II suggest that not all clausal elements play an equal role in shaping the development of the message. Where theme is the ground from which the clause takes off, it would appear that the thematic portion must comprise, either partially or in its entirety, an element that is capable of constraining the following segment in such a way that the latter must not be odd in relation to it. Textual and interpersonal markers are not sufficiently capable of ensuring this situation.
- (c) Given some initial element, it is possible to anticipate that the message in the clause will proceed in a particular way. Associations are established, in varying degrees, between what is likely to surface and what has been hitherto processed. These associations represent prototypical situations as captured in the knowledge base of the language user.
- (d) On the other hand, a bridging strategy is resorted to when the message in the clause is assessed. This involves the relating of specific parts of the

clause with other parts. The message structure of the clause, with a point of departure and a goal of discourse, is considered in its entirety, underscoring the functional importance of both portions of the clause.

7. Rethinking theme and rheme

The findings of the study suggest an alternative way by which the theme-rheme notions may be understood. As a concept of initialness, a reasonable claim about theme is that it prepares the decoder for what is to come. If this is not fulfilled (that is, if the expectation is dashed), the decoder will be forced to either revise the earlier expectation or reject the construction.

Two notions in cognitive psychology have been particularly helpful in enabling us to account for the findings in this study more formally. The first is schema theory, first articulated in Kant (1934) and later expanded in Head (1920), Bartlett (1932), and Piaget (1955). The second concerns inferences, the activation of information derived from background knowledge or memory (van den Broek 1994: 557).

7.1. Schema theory

Schema theory is a powerful yet flexible account of the way we store and process our knowledge of the world, whether in terms of processing language or making sense of events. We may view a schema as "a data structure for representing generic concepts stored in memory" (Rumelhart 1984: 2). When activated, a schema provides the relevant background knowledge or context that is needed for goal-oriented action, interpretation, or the generation of inferences (Hall 1989: 392-393). It permits associations to be established between linguistic items and, as we have seen in Part I of the study, serves largely an anticipatory function on the likely outcome of the clausal message. Rumelhart's analogy of schemata as theories, to this end, is particularly enlightening:

Theories, once they are moderately successful, become a source of predictions about unobserved events. Not all experiments are carried out. Not all possible observations are made. Instead, we use our theories to make inferences with some confidence about these unobserved events. So it is with schemata (Rumelhart 1980: 38).

Here, a schema functions "as a kind of informal, private, unarticulated theory about the nature of the events, objects, or situations that we face" (Rumelhart 1980: 37). That is to say, we rely on our schemata to account for some aspect of a new experience. The processing of any incoming input, therefore, is akin to "hypothesis testing, evaluation of goodness to fit, and parameter estimation" (Rumelhart 1980: 38). Whenever a particular schema fails to account for the

new experience, it is either accepted in a modified form or rejected in search for another possibility.

Broadly, the schemata that are consciously activated during language processing may be grouped under three categories (compare with Goatly 1997: 137):

- (a) World knowledge – an inventory of our generic knowledge of concepts, abstract or otherwise, in our long-term memory.
- (b) Knowledge of context – our awareness of the range of relevant contextual factors, including co-text, that have a bearing on the discourse.
- (c) Knowledge of pragmatics – this alerts us to the discourse strategies that are used in the communicative encounter. The knowledge of such strategies is a part of world knowledge and provides information as to why language is used in a particular way.

In addition to these knowledge structures, it is submitted that language processing also draws upon our knowledge of the language concerned (linguistic competence). The results in Part I of the study has particular relevance here. Since our knowledge of the world is an inventory of schemata, and language acquisition is conditioned by external factors, our language schema, comprising what we know about language, cannot be independent of this inventory but is a part of it. The language schema can be viewed from numerous angles (whether a particular sound is possible, how words are put together, and so on). Bybee and Slobin (1982), for example, investigated the use of English irregular verbs among people of different age groups and found that a specific form of language schema aided in the identification of the past forms of such verbs. Here, we shall be concerned with our knowledge of the structure of language at the level of the clause (e.g., how declaratives are typically structured, and so on). We shall refer to the structural schema as S_1 and all other schemata (hereafter *other schemata*) that come to bear on our interpretation of any clausal message as S_2 . In terms of consciousness, it is surmised that S_1 tends to operate at a lower level than S_2 . There is an apparent ease by which we are able to produce and comprehend novel constructions. As Wingfield (1993: 201) remarks, these are "automatic processes over which we exert little control".

7.2. Inferences

Closely associated with schema theory is the role of inferences during the processing of inputs, linguistic or otherwise. An inference is "any piece of information that is not explicitly stated in a text" (McKoon – Ratcliff 1992: 440). This includes both transient activations of information, word-based inferences and any information that is derived from background knowledge or memory (schemata) (van den Broek 1994: 557). The present study suggests that at least two types of inferences are involved during language processing at the clause level.

The first type – forward inference – need not be specific in nature, but “refers to the anticipation of any aspect of future events, ranging from a specific expectation that a particular event will take place to a vague sense that something will occur” (van den Broek 1994: 570). Forward inferences serve as anticipators for some future event or development of the present input. The second type – backward inference – serves to connect two stretches of language as a coherent whole. Usually, connecting inferences are discussed at the text level between one clause (complex) and another. There is no strong reason, however, why such inferences cannot also occur clause-internally (van den Broek 1994: 557).

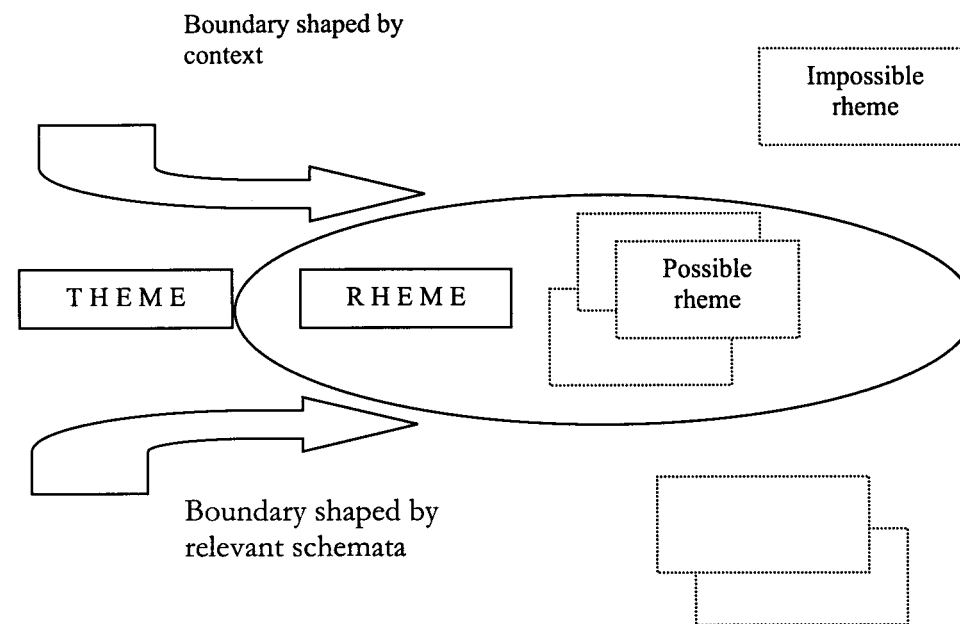
7.3. Inference-boundary model

In presenting the model, we shall be making the basic assumption that “inferences are obviously generated when individuals comprehend text” (Graesser – Clark 1985: 1; see also van den Broek – Fletcher – Risdien 1993: 169). The study suggests that a useful way of interpreting theme is to understand it as an element that determines a boundary within which it is permissible for the rheme to occur. In this light, the primary function of theme is not simply to introduce the rheme but to do so within a frame of acceptability so that the clause makes sense only if both its theme and rheme are considered together.

When a clause is processed, it is held that there is an interplay of knowledge structures related to language and the world in general. Together with the prevailing context, these schemata establish a boundary of acceptability within which it is permissible for the rheme to occur. Since the lexicogrammatical form of language is highly typical, forward inferences in S_1 tend to be specific. However, since language cannot be meaningfully processed independently from S_2 , the interpretation of any linguistic input requires the operation of both S_1 and S_2 in tandem. The activated schemata are guided “both by the local clues and by consistency among the various levels of analysis” (Rumelhart 1980: 46). This returns us to Rumelhart’s analogy of schemata as theories; we are constantly engaged in hypothesis-testing on the goodness of fit of the input to the activated schemata.

As compared to S_1 , it is unlikely for specific inferences to be generated in S_2 (although they are not to be precluded). Rather, in S_2 , we infer that the message will proceed in a constrained but non-specific way. A backward inference occurs when the decoder reaches the end of the clause to relate the rheme to the theme, establishing the appropriateness of the theme-rheme relationship. Within the clause, specifically, it is submitted that backward inferences operate on the premise that there is a degree of appropriateness that links the rhematic portion of the clause with the theme that governs it. These prompt the decoder to either accept or reject constructions on the basis of this relationship and serve as a check to prevent unacceptable rhemes from surfacing.

Figure 3. IB model.



The postulated theme-rheme model (hereafter *inference-boundary*, or IB, model) is summarised schematically in Figures 3 and 4 (from Leong 2000: 13-14).

The ellipse in Figure 3 represents the boundary of acceptability generated by the thematic element. Of the possible rhemes within the boundary, only one is eventually selected as the actual rheme. Rhemes which fall outside the boundary are blocked from co-occurring with the theme since this would result in an unacceptable clause.

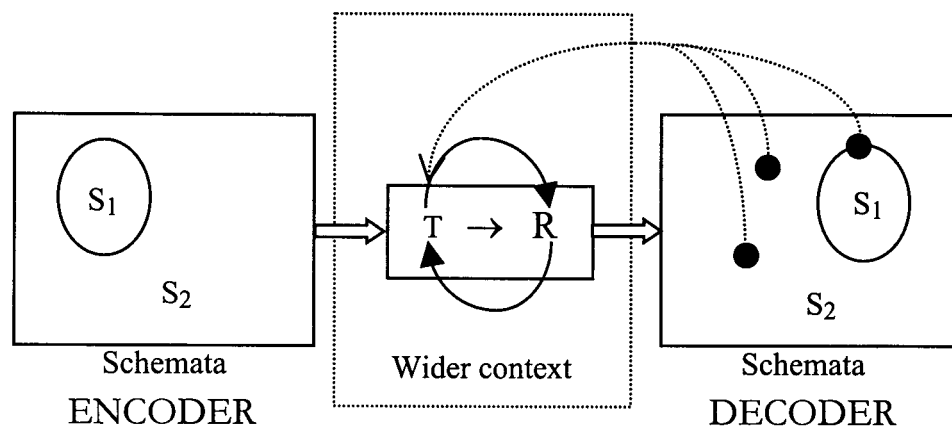
7.4. Principle of acceptable message development

Based on the IB model, an interesting fact about the behaviour of the thematic portion of the clause becomes evident. Because it activates a boundary which excludes impossible rhemes, it constrains what can come after it. We shall refer to this as the *principle of acceptable message development* (hereafter AMD principle). More precisely:

The AMD principle dictates that the theme of a clause must be acceptably developed by the rheme in the context of the interactive encounter, whether in the written or spoken mode.

But where theme is capable of activating a boundary of acceptability, it carries with it the potential of being *unacceptably* developed by an inappropriate

Figure 4. Encoder-decoder IB model.



where

⇒ message direction from encoder to decoder

⋯⇒ schema-based inferences activated during language processing

→ forward and backward inferences (as indicated by arrow direction)

● relevant activated schemata

T theme

R rheme

rheme, and this turns out to be a useful test for delimiting theme. Using well-formed clauses, the line separating theme and rheme may not be easy to discern. However, since theme has the potential of being unacceptably developed, we could approach the problem from another angle and find out what would happen if we were to flout the AMD principle. That is to say, what would happen if we were to form an unacceptable construction by retaining the initial element of the clause? We might discover, at first, that it is not possible for an unacceptable clause to be formed based on the clause-initial element. If so, that element cannot be regarded as being fully thematic since we have not yet been able to locate an unacceptable rheme. What needs to be done, then, is to keep flouting the AMD principle for each succeeding element until we are able to form an unacceptable clause comprising a mismatch between the initial portion of the clause and what follows it. That (initial) stretch of language that is AMD-floutable is the thematic portion of the clause.

In the Hallidayan framework, themes are categorised by way of the broad metafunctions of language. Unlike Halliday, however, the emphasis here is on locating an initial-element that is able to enter into a theme-rheme mismatch. To avoid any terminological confusion, we will resort to the more general *head* and

non-head distinction to separate initial elements which are not yet able to satisfy the flout-AMD procedure and those which are fully able. Like Halliday, this acknowledges that there is an internal structure within theme, but it also emphasises the idea of thematic prominence, of some element being more or less able than another to satisfy the flout-AMD procedure.

To illustrate the above, consider (81a) (assuming normal context):

(81) a. *John kicked the ball.*

It is easy to construct an unacceptable clause using *John* as the initial element, as in (81b):

(81) b. **John laid an egg.*

This element, therefore, is minimally enough for an unacceptable clause to be formed and is functionally the thematic head.

Next, consider (82a):

(82) a. *Fortunately, John kicked the ball.*

Somewhat mechanically, we might proceed to form (82b) and conclude that the AMD principle is floutable using *Fortunately* as the minimal element:

(82) b. **Fortunately, John laid an egg.*

Examining (82b) carefully, however, we realise that it is odd not because *Fortunately* is unacceptably developed by *John laid an egg*, but because *John*, as a human being, cannot lay eggs. That is to say, a theme-rheme mismatch is not yet possible using *Fortunately* as the minimal element. This indicates that thematic heads must be sufficiently robust to serve as the peg on which the message is hung. It is submitted that modal and conjunctive adjuncts do not appear to possess this robustness and have only an indirect influence on the flow of the message proper (see Section 5.2). They are, therefore, to be regarded as thematic non-heads. Monaghan (1979: 133), in fact, regards such elements as non-cognitive themes since “they only draw attention to the relation of the [clause] as a whole to something else” and “do not prevent a cognitive thematic choice [from] being made in the same clause”. Extending the flout-AMD procedure to the next element will give us *John* as the thematic head.

How, then, is thematic robustness determined? My proposal is that we view it in terms of how well the candidate for thematic head is integrated within the clause. On a note of caution, this should not be confused with the obligatoriness-optionality distinction since conjunctions and adjuncts are optional elements in clause structure. By integration, rather, I mean that the initial element “is integrated to some extent in clause structure if it is affected by clausal processes”

(Quirk et al. 1972: 421). Since adjunct thematic heads are integrated in clause structure and are therefore important to the clause-internal message, they provide information that is intimately associated with the message concerned. This makes it possible for them to be contrasted with another similar adjunct in alternative negation, as in (83a-b). This, in contrast, is generally not possible for non-robust adjuncts and conjunctions, as evident in (84a-b):

- (83) a. *On Tuesday, John did not go to school, but on Wednesday, he did.*
 b. *As a child, he loved to catch spiders, but as an adult, he detested it.*
 (84) a. **Amazingly, John did not go to school, but surprisingly, he did.*
 b. **However, John did not go to school, but in recollection he did.*

Extending now the flout-AMD procedure to imperatives and interrogatives, we obtain:

- (85) a. *Will John paint the wall?*
 b. **Will John bloom this spring?*
 Theme → *Will John* (pre-head = *Will*; head = *John*)
 (86) a. *What can you do?*
 b. **What does it go?*
 Theme → *What* (head = *What*)
 (87) a. *Come here!*
 b. **Come there!*
 Theme → *Come* (head = *Come*)

A problem that might be encountered in the flout-AMD procedure arises in make-believe worlds where almost anything is possible. To get round this problem, it is proposed that context be viewed in two broad forms. The first, *primary context*, applies to the general situation of the real world. This is the world that we are familiar with and comprises the smaller, restricted context of the communicative encounter. The second, *secondary context*, is the make-believe world where reality is distorted. Secondary context, however, does not immediately apply to all fictional communicative encounters, but only to those where the make-believe world has been endowed with some unique characteristic that is far-fetched or impossible in the present world. The flout-AMD procedure in such a situation must therefore result in a clause that is unacceptable in relation to the adjustments that have to be made in the secondary context. We may consider (88a) below, taken from a children's tale:

- (88) a. *In Eileen's nursery the toys were very busy each night. They held a sewing-meeting and each toy borrowed a needle from Eileen's work-basket, threaded it with cotton, and began to sew hard. They were sewing tiny flannel coats for the pixies who lived in the daffodil beds below the nursery window* (Blyton 1966: 78).

Using the second sentence in (88a) as an example, the flout-AMD procedure will give us the following result in (88b), where *they* (referring to the toys in Eileen's nursery) is the thematic head:

- (88) b. **?They shed skin ...*

8. Residual problems

An obvious shortcoming of the respondent study is the problem of constrained contextualisation. Although the respondents were told from the start that there were no extraordinary contextual factors at play, it might be pointed out that several of the odd constructions in Part I could be acceptable in an entirely different context.

Together with the language user's socio-cultural knowledge and the linguistic context provided by the preceding text, it is agreed that the language user has, at his or her disposal, a rich array of resources to turn to in making sense of a clause-based message. Consider (89a) below, for example, which is based on (18) and a make-believe world where animals have human-like qualities:

- (89) a. *"You are mistaken," the badger said to the bee. "We did not visit your hive at all. The bird played soccer last night. I, on the other hand, slept very early."*

Nevertheless, it is submitted that even in fantasy worlds, limits of acceptability do exist and that the following constructions are unlikely to be accepted by many:

- (90) **The bird gave birth to a baby boy.*
 (91) **The bird raised its trunk in protest.*

The reason for this is that even in a make-believe world, the individual's schema of a typical bird cannot be too radically modified to the extent that it includes child-bearing capabilities or a *trunk* as part of its anatomy. A (mythical) animal might well have both this capability and a trunk, but it would then have to be known by some other name, and not *bird* alone.

Other than clauses such as (90-91), there is yet another way by which an unacceptable construction may surface in a text. Let us, for this purpose, rewrite (89a) as (89b) (retaining the assumption of a make-believe world where animals have human-like qualities):

- (89) b. **"Oh, the bird and I did absolutely nothing last night," the badger said to the bee. "The bird played soccer last night. I, on the other hand, slept very early."*

In (89b), we see the effect of the preceding textual context in shaping what is permissible in the text. Where *The bird played soccer last night* is perfectly acceptable in (89a), it is problematic here in (89b).

The contextual factor, doubtless, has a significant impact on the direction and development of a particular message. The human mind is sensitive to the availability and application of such contextual information, regardless of whether such details are in relation to the setting, mood of the discourse encounter, cultural awareness, and so on. Due to the amount of processing effort that is required, it is reasonable to postulate that the human mind works on the principle of least effort, and this is where the surrounding context aids the decoder greatly in anticipating and selecting the most probable outcome. Notwithstanding this, there is something far more robust that characterises the thematic element in general, and that is, even in the absence of any textual context, it needs to be stable enough to constrain the development of the message in the following segment and, at the same time, trigger decoder expectation(s) in this respect.

Accommodating the full range of contextual and other factors in the respondent study, however, would have complicated the focus of the discussion unnecessarily. This is not to deny that they have an important role to play in language processing. Rather, it is felt that before these complex issues can be fully contemplated, the fundamental characteristics of theme and rheme should first be more clearly understood. To this end, the use of isolated clauses and clause-initial elements in the respondent study has revealed several insights. For a more detailed investigation of the interplay of other factors, the methodology adopted here will need to give way to protocol analysis (e.g., Flower – Hayes 1981; Doheny-Farina 1989).

9. Concluding remarks

Based on the exploratory study, we have found that it is generally possible to repair unacceptable constructions by replacing some initial or near-initial element. Not all elements, however, play an equal role in shaping the clausal message. In particular, textual connectors and interpersonal markers are unable to capably constrain the following portion in such a way that it forbids this portion from being odd in relation to it. The study has also indicated that both forward and backward inferences appear to be generated during language processing, and that these essentially establish whether the theme-rheme pair has been appropriately matched.

A cognitive psychological model – the IB model – is proposed to account for the main findings of the study. It argues that the theme of the clause is that which guides, in context, the development and direction of the clausal message. It specifically relates, by way of the AMD principle, the thematic portion of the clause with the rheme which follows it. In this way, it offers an explanatory ac-

count of why a thematic element is what it is (as the constraining force on the acceptable development of the clausal message) and how it might be delimited (by the flout-AMD procedure).

The IB model is admittedly tentative at this stage and needs to be refined through more extensive respondent and text-based studies (but see Leong 1999a, 1999b on the extension of the IB model to texts and spontaneous conversation). The application of the IB model in instances where less reliance is needed on theme-rheme structure for communication to take place, for example, is an interesting area for further work. The use of codes as an exclusion device is a case in point. It would also be interesting to see if the IB model is applicable to languages other than English (e.g. Leong 1999c), and what it is able to reveal to us about the message structure of language in general.

The proposed IB framework, then, provides a platform from which further research on theme and rheme may be undertaken to enhance our understanding of these elusive notions. More importantly, perhaps, the acknowledgement and incorporation of paralinguistic and other factors offers us another avenue for a multi-disciplinary collaboration in language research.

REFERENCES

- Bartlett, Frederick C.
1932 *Remembering: A study in experimental and social psychology*. Cambridge: CUP.
- Bates, Elizabeth
1976 *Language and context: The acquisition of pragmatics*. New York: Academic Press.
- Blyton, Enid
1966 *The blue story book*. St. Albans: Granada.
- van den Broek, Paul
1994 "Comprehension and memory of narrative texts: Inferences and coherence", in: Morton Ann Gernsbacher (ed.), 539-588.
- van den Broek, Paul – Charles R. Fletcher – Kirsten Risden
1993 "Investigations of inferential processes in reading: A theoretical and methodological integration", *Discourse Processes* 16, 1-2: 169-180.
- Brown, Ann L – Jeanne D. Day
1983 "Macrorules for summarizing texts: The development of expertise", *Journal of Verbal Learning and Verbal Behavior* 22, 1: 1-14.
- Bybee, Joan L. – Dan I. Slobin
1982 "Rules and schemas in the development and use of the English past tense", *Language* 58, 2: 265-289.
- Cooper, Charles R. – Sidney Greenbaum (eds.)
1986 *Studying writing: Linguistic approaches*. Beverly Hills: SAGE.
- Dahl, Östen
1974a "Topic-comment structure revisited", in: Östen Dahl (ed.), 1-24.
1974b "Topic-comment structure in a generative grammar with a semantic base", in: František Daneš (ed.), 75-80.
- Dahl, Östen (ed.)
1974 *Topic and comment, contextual boundness and focus*. Hamburg: Buske.

- Daneš, František (ed.)
1974 *Papers on functional clause perspective*. The Hague: Mouton.
- Dezső, László – György Szépe
1974a "Contribution to the topic-comment problem", in: Östen Dahl (ed.), 65-93.
1974b "Two problems of topic-comment", in: František Daneš (ed.), 81-86.
- Dirven, René – Vilém Fried (eds.)
1987 *Functionalism in linguistics*. Amsterdam: John Benjamins.
- Doheny-Farina, Stephen
1989 "A case study of one adult writing in academic and nonacademic discourse communities", in: Carolyn B. Matalene (ed.), 17-42.
- Erteschik-Shir, Nomi
1988 "Topic-chaining and dominance-chaining", in: Yishai Tobin (ed.), 145-153.
- Firbas, Jan
1975 "On the thematic and the non-thematic section of the clause", in: Håkan Ringbom (ed.), 317-334.
1986 "On the dynamics of written communication in the light of the theory of functional clause perspective", in: Charles R. Cooper – Sidney Greenbaum (eds.), 40-71.
1987 "On the delimitation of the theme in functional clause perspective", in: René Dirven – Vilém Fried (eds.), 137-156.
1992 *Functional clause perspective in written and spoken communication*. Cambridge: CUP.
- Flood, James (ed.)
1984 *Understanding reading comprehension: Cognition, language, and the structure of prose*. Newark, Del.: International Reading Association.
- Flower, Linda
1988 "The construction of purpose in writing and reading", *College English* 50, 5: 528-550.
- Flower, Linda – John R. Hayes
1981 "A cognitive process theory of writing", *College Composition and Communication* 32: 365-387.
- Gernsbacher, Morton Ann (ed.)
1994 *Handbook of psycholinguistics*. San Diego: Academic Press.
- Gleason, Jean Berko – Nan Bernstein Ratner (eds.)
1993 *Psycholinguistics*. Fort Worth: Harcourt Brace Jovanovich.
- Goatly, Andrew
1997 *The language of metaphors*. London: Routledge.
- Graesser, Arthur C. – Leslie F. Clark
1985 *Structures and procedures of implicit knowledge*. Norwood, NJ: Ablex.
- Hajičová, Eva
1994 "Topic/focus and related research", in: Philip A. Luelsdorff (ed.), 245-275.
- Hall, John F.
1989 *Learning and memory*. (2nd edition.) Boston: Allyn and Bacon.
- Halliday, Michael A.K.
1985 *An introduction to functional grammar*. (2nd edition published in 1994.) London: Edward Arnold.
1970 "Language structure and language function", in: John Lyons (ed.), 140-165.
- Head, Henry
1920 *Studies in neurology*. London: Frowde.
- Kant, Immanuel
1934 *Critique of pure reason*. (2nd edition, translated by J.M.D. Meiklejohn.) London: J.M. Dent and Sons.

- Kintsch, Walter
1993 "Information accretion and reduction in text processing: Inferences", *Discourse Processes* 16, 1-2: 193-202.
- Koktová, Eva
1996 "Wh-extraction and the topic-focus articulation of the clause", in: Barbara H. Partee – Petr Sgall (eds.), 255-271.
- Lambrecht, Knud
1994 *Information structure and clause form: Topic, focus and the mental representations of discourse referents*. Cambridge: CUP.
- Leong, Ping Alvin
1999a "Text-level themes: A cognitive psychological perspective", *Text* 19, 1: 25-55.
1999b "Some thoughts on talk: Themes and thematic progression", *Working Papers on Language, Literature and Theatre* (National University of Singapore) 16.
1999c "Theme and rheme in Chinese: A cognitive psychological perspective", *Journal of the Chinese Language Teachers Association* 34, 3: 49-76.
2000 "The inference-boundary model: Reinterpreting theme and rheme", *Language Sciences* 22, 1: 1-26.
- Luelsdorff, Philip A. (ed.)
1994 *The Prague school of structural and functional linguistics: A short introduction*. Amsterdam: John Benjamins.
- Lyons, John
1970 *New horizons in linguistics*. Harmondsworth: Penguin.
- Matalene, Carolyn B. (ed.)
1989 *Worlds of writing*. New York: Random House.
- McKoon, Gail – Roger Ratcliff
1992 "Inference during reading", *Psychological Review* 99, 3: 440-466.
- Monaghan, James
1979 *The neo-Firthian tradition and its contribution to general linguistics*. Tübingen: Max Niemeyer Verlag.
- Partee, Barbara H. – Petr Sgall (eds.)
1996 *Discourse and meaning: Papers in honor of Eva Hajičová*. Amsterdam: John Benjamins.
- Peregrin, Jaroslav
1996 "Topic and focus in a formal framework", in: Barbara H. Partee – Petr Sgall (eds.), 235-253.
- Piaget, Jean
1955 *The construction of reality in the child*. London: Routledge and Kegan Paul.
- Quirk, Randolph – Sidney Greenbaum – Geoffrey Leech – Jan Svartvik
1972 *A grammar of contemporary English*. London: Longman.
- Raimes, Ann
1985 "What unskilled ESL students do as they write: A classroom study of composing", *TESOL Quarterly* 19, 2: 229-253.
- Ringbom, Håkan (ed.)
1975 *Style and text: studies presented to Nils Erik Enkvist*. Stockholm: Språkförlaget Skriptor.
- Rumelhart, David E.
1980 "Schemata: The building blocks of cognition", in: Rand J. Spiro – Bertram C. Bruce – W. F. Brewer (eds.), 33-58.
1984 "Understanding understanding", in: James Flood (ed.), 1-20.
- Sgall, Petr
1974 "Focus and contextual boundness", in: Östen Dahl (ed.), 25-51.
1975 "On the nature of topic and focus", in: Håkan Ringbom (ed.), 409-415.

- Sgall, Petr – Eva Hajičová
1977 “Topic-comment articulation and negation in a functional generative description”,
Prague Studies in Mathematical Linguistics 5: 297-308.
- Spiro, Rand J. – Bertram C. Bruce – W. F. Brewer (eds.)
1980 *Theoretical issues in reading comprehension: Perspectives from cognitive psychology, linguistics, artificial intelligence, and education*. Hillsdale, NJ: Lawrence Erlbaum.
- Thompson, Geoff
1996 *Introducing functional grammar*. London: Arnold.
- Tobin, Yishai (ed.)
1988 *The Prague school and its legacy in linguistics, literature, semiotics, folklore, and the arts*. Amsterdam: John Benjamins.
- Weil, Henri
1978 *The order of words in the ancient languages compared with that of the modern languages*. (Translated by Charles William Super.) Amsterdam: John Benjamins.
[Originally published in 1844 as *De L'ordre des Mots dans les Langues Anciennes Comparées aux Langues Modernes*.]
- Wingfield, Arthur
1993 “Clause processing”, in: Jean Berko Gleason – Nan Bernstein Ratner (eds.),
199-235.