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Word- and Picture Semantic Impairments

Worksheets for Aphasia Therapy

Drawings by Michaela Bautz

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Part 1

Word Semantic Impairments

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Notes to the Translation

Word and Picture Semantic Impairments is a translation into English of two volumes of a German series for aphasia therapy. For the first time, both volumes are offered together in one folder in the English version. *Word and Picture Semantic Impairments* is available in both British and American English.

The worksheets were translated in accordance with the linguistic system on which the German edition is based. Word-for-word translations were avoided wherever they were not compatible with the underlying linguistic purpose.

The two versions of the material each contain their own series of worksheets, entitled ‘GB version’ and ‘US version’. They differ both in terms of the word and the picture material as a result of orthographic and lexical factors, differences in frequency of use, and cultural aspects.

There is one common accompanying booklet for the two versions. Differences between the British and the American version are indicated in the form ‘English variation/American variation’ (e.g. *motorway/highway*).

Contents

THERAPEUTIC INDICATION

Part 1 of *Word- and Picture Semantic Impairments* presented here is directed towards the treatment of lexico-semantic disorders of various degrees of severity, which can occur in the form of word-memory or word-finding disorders within the various clinical syndromes. Our therapy material is, therefore, not primarily syndrome-oriented, but rather disorder-specific. The material can be used for all patients in whom impairments of the semantic structure of spontaneous speech, semantic paraphasias or word-finding disorders in the naming or describing of situational images, or receptive semantic disorders in auditory or written language comprehension have been established.

The material is as equally suited for the treatment of global aphasias in which severe receptive and productive disorders are present, as it is for all forms and degrees of severity of Wernicke aphasias, for Broca aphasia with word-memory or word-finding deficits, and also for naming impairments or 'mild' semantic disorders which can not be classified. Important is that the selection, combination and application of the material provided here is appropriate for the treatment of the syndrome and the individual disorder profile.

For many patients there will be indications of further disorders which require the application of additional material, be it parallel, prior, or subsequent to treatment with the work sheets presented here.

THEORETICAL BACKGROUND

A neuro-linguistic oriented therapy for aphasic impairment has as its fundamental premise, that the noticeable deficits and imperfections in the patient's speech behaviour are directly attributable to lesions or functional impairments in either the neural structure, or processes in the brain. This highly complex relationship between brain structure and speech behaviour also forms the framework for the analysis of lexical-semantic deficits in aphasic speech production or perception which can be established under clinical observation, e.g. with the aid of an aphasia test.

There are certain structures and processes in the brain which are specialised in the representation of semantic knowledge or in the calculation of semantic relations. Impairments within this neural system lead directly to the loss or defective processing of this semantic information, which in turn manifests itself as aphasic speech behaviour e.g. as semantic paraphasia.

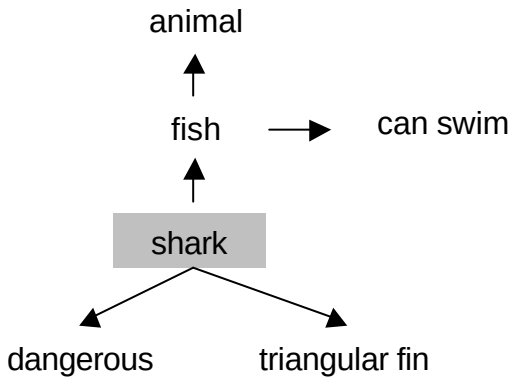
In modern linguistic lexicon theories there is general agreement concerning the psychological existence of a semantic lexicon, or the existence of semantic properties in the lexicon entry of so-called open class items, however, little is known about the structural organisation of internal semantic systems and the current state of research is correspondingly heterogeneous.
With regard to the causes of semantic impairment in aphasia, it is still possible

to differentiate between two theoretical positions, which are the subject of controversial discussion: the first views the causes of the semantic deficit as impaired access to an intact system of semantic information (cf. first and foremost Priming Studies by Blumstein et al. 1982; Milberg and Blumstein, 1981; Milberg et al. 1987), the other hypothesis explains the impairment by means of defective/incomplete semantic representations or a structural disintegration of the semantic lexicon (e.g. Goodglass and Baker, 1976; Stachowiak, 1979).

A second controversy concerns the method of representing semantic knowledge and, correspondingly, the question of the structural and operative parsing routines by means of which this information is made available and processed. Representatives of the *feature model* (see Smith et al., 1974) proceed from the assumption that the meaning of a word is composed of semantic features, each of which expresses a component of word meaning. These information units are, however, not all equally relevant for any particular concept, some are central and others are peripheral. Those which are central are those features which have a definitional value for the word meaning; peripheral are those of a more coincidental nature (cf. Smith et al., p 216). The value or ranking of these features can be viewed as a continuum, i.e. there is no principle or formal difference between them, even where concepts are closely related and share several features, the same feature can in one case be more central than in the other. The ranking of a particular feature is determined by its degree of relevance to the concept in question. This has the advantage, and paradigmatic experiments have since borne out this supposition, that our concepts are not only organised hierarchically, but within a semantic category some concepts are more prototypical than others (cf. Rosch et al., 1976; Leuninger et al., 1987). It has been shown, for example, that a *ball* is an especially typical example of the semantic category *toy*; *shark*, on the other hand, is a much less prototypical representative of the category *fish* than, for example, *carp* or *trout*. Within the feature model, the term *fish* would have the following feature structure: (LIVING), (CAN SWIM), (HAS SCALES). These features are also presumed to be central for concepts such as *trout* or *carp*, whereas for the meaning of *shark*, features such as (DANGEROUS), (TRIANGULAR FIN) or (TEETH) are more likely to be definitive.

If such a model of the semantic representation of knowledge is adopted, then in language processing the meanings of words are calculated using semantic features. Meaning relationships or semantic similarities between words follow from the comparison of their semantic features. The hierarchical structure of the superordinate and subordinate concept relationship, as between *fish* and *trout* is defined via the number of intersecting features: the abstract superordinate concept quite simply relies on fewer defining features than the subordinate concept. The *feature model* implies that in the processing of a word, all of its semantic features are (must be) processed, and therefore requires more complex and comprehensive but at the same time deeper semantic processing than its rival, the *network model* (see Collins & Quillian, 1972; Collins & Loftus, 1975) views the terms and their features as a form of semantic network; the information on the phonological features of the words

is contained in a separate network. The formal design of the semantic network is so constructed that concepts and semantic features are represented as knots. These knots are connected by means of directional arrows which represent the associative relations which exist between the concepts and the features. The more connections there are between two concepts, the greater their semantic similarity. The configuration of the directional arrows, which is stored with a word, represents its meaning. The previously employed example would be represented as follows in the network model (see Leuninger, 1989, p 86):



The feature *can swim*, which is associated with the concept *fish*, applies also to all subordinate concepts such as *shark, trout, carp* etc. The information can be read directly from the superordinate/subordinate concept relation, and therefore it is not necessary that it be stored separately in every subordinate concept. In contrast to the feature model, the hierarchical organisation of the semantic network makes it possible to access information on the superordinate term and hyponymy of a concept directly. With regard to the processing of concepts, the advocates of the network model assume that the semantic activation expands to include associated concepts. The more strongly a term is linked with the activated concept or the more closely they are located within the network, the stronger will the term be affected by semantic activation. "From the aphasiological point of view, the similarities of semantic paraphasias and above all observations from speech therapy indicate that the activation processes include a larger range of concepts. Word-finding difficulties can be eliminated or reduced by, among other things, providing the patients repeatedly with information from varying sources concerning the composition of semantic fields and the relationships between the words." (Stachowiak, 1979, p 178)

Nevertheless, whichever of these competing models one favours at present, it remains an empirical question, whether language concepts are to be understood as a number of semantic features or as internally unstructured units, and whether they must be calculated or simply activated in a semantic network. Without wishing to subscribe to either one of these approaches, and they may even be compatible, it is sufficient for our purposes to assume that the semantic lexicon is organised internally in such a way that various kinds meaning relationships exist between individual concepts. Terms which are particularly closely related form a semantic field. Within such a sub-system there exist particularly strong and numerous semantic connections between the concepts, some of which are especially typical elements for the field.

In the semantic relationships themselves it is possible to differentiate between classificational (super and subordinate concept, hyponymy, Part-of Relation) and non-classificational relationships (situational-referential, associative, pragmatic etc.), whereby the

former are hierarchical and form the organisational framework of the semantic lexicon. With respect to the individual concept, we differentiate between central and peripheral semantic features or properties. The centre or core of a concept is formed from all the classificational information (*animal-dog-poodle; dog-cat; poodle-dachshund; dog-muzzle*) as well as the non-classificational information with the highest level of intersubjective agreement within the speech community (*lemon-yellow; broom-to sweep*). On the other hand, the concept periphery consists of idiosyncratic or coincidental properties which are connected with the term in question (*bachelor-untidy; neighbour-dog*). The transition from the centre to the periphery of a concept is continuous, and the intersubjective variance of semantic information increases as one moves away from the centre towards the outside.

As shown by Rosch et al. (1976), there certainly seem to be concepts within the semantic lexicon, so-called basic concepts, which are accorded a special status. This comprehensive experimental study concludes that there is a basic conceptual level of abstraction in which meaning categories contain most information, and which therefore differ most clearly from other categories. The basic concepts occupy a middle position in classifications such as *animal-**fish**-shark* or *toy-**ball**-football*. The experiments show, among other things, that most attributes are connected with these concepts and that they were used noticeably often by the volunteers to describe both the superordinate and subordinate categories (for information on the relationship between basic concepts and aphasia in German, see Leuninger et al., 1987).

These briefly outlined considerations, which offer only a very limited view of the extremely exciting and varied state of current research, provide the basis for the development of this materials package for lexico-semantic impairment therapy which is designed to contribute to the effective, systematic treatment of these aphasic deficits. The general factors governing the susceptibility to impairment or defective processing of semantic information in the lexicon can, in our opinion, be grouped systematically as follows (cf. Stachowiak, 1979, p 195):

- In principle, aphasia can produce conditions in which both the individual concepts and the interconceptual relationships and connections may be impaired.
- Similarly, impairments are not only confined within the semantic system, but they also occur in the processing of the information contained therein.
- It is also conceivable that such defective processing could be linked to hyper or hypo-activation of the semantic network (which itself may only be temporary), while the representations and the processing systems themselves are intact. Which of these impairments, observed as lexico-semantic deficits in speech behaviour, correlates with which syndrome, or indeed, whether such clearly definable relationships exist remains a neuro-linguistic secret and hence the subject of further investigation.

STRUCTURE AND APPLICATION OF THE MATERIAL

FORMAL STRUCTURE AND NOTATION PRINCIPLES

This collection of work sheets is divided into 12 chapters. Each of these chapters contains tasks of various degrees of difficulty and of varying processing modalities on both the word and the sentence level. The chapters have been developed according to linguistic criteria, and each focuses on an important lexical or semantic relation. We have begun, however, with the central issue of classificatorial relations, and after focusing on other lexicon-internal relations we deal with sentence relevant relations. Any part of the material can be used as the starting point - the chapters are not arranged in a logical series which must be covered one after the other, rather, it is a loose collection of modular units. Equally unimportant for the optimal sequence of exercises is the order of the individual worksheets within the chapters. For pragmatic reasons e.g. in order to facilitate the search process for the user, the worksheets are always arranged according to the following principle: the 'word' worksheets are at the beginning of the chapter, followed by the 'sentence' worksheets. Within these groupings, the exercises are ordered according to the processing modalities. First come the 'differentiation' (DIF) tasks which can be solved in a purely receptive manner, followed by the 'select' (SEL) tasks which include a productive component, and finally the 'construct' (CON) worksheets which focus solely on productive reactions. In addition to containing information pertaining to the three characteristics, 'lexico-semantic relation' (corresponds to the chapter names and numbers), 'word or sentence level' (W/.. or S/..), and 'processing modality' (../DIF, ../CON, ../SEL), each worksheet has also been labelled according to which of the syntactic word categories (S for sentence, N for noun, V for verb, and A for adjective) are involved in the lexico-semantic relation in the exercise in question. Of these labels (N/V or V/N ... etc.), the first element refers to the category of the given word in the exercise, and the second to the required word which the patient is expected to find.

THERAPEUTIC SETTING

The material is particularly suited for use in individual therapy; it can be employed by the therapist as a collection of auditory exercises or it can be used by the patient in written form with appropriate assistance from the therapist. The material can also be employed independently by patients after prior successful use in individual therapy - irrespective of whether subsequent use is in an individual or a group setting. In some cases, the material is suitable for patients who have completed in-patient rehabilitation and who intend to work on their own.

WORD/SENTENCE LEVEL AND PROCESSING MODALITIES

In contrast to single words, sentences do not only make particular demands on processing, but within the context of word-memory and word-finding impairments they also create a framework which can both facilitate and de-block at the same time. Care has been taken, where sentences are employed, to keep the syntactic requirements constant and at a generally low level (where this is not the case, this is made

clear in the material description), in order to ensure that the exercises in the sentence context are also accessible to patients with severe disorders. It is generally true of the so-called sentence worksheets, that an unimpaired ability to process sentences is not required in order to be able to complete the task successfully. A second reason why the sentence context is indispensable as a framework for many word-memory and word-finding processes is that the semantic relations which are primarily located on the periphery are often only created within the sentence context itself.

The processing modality is not an unimportant factor when judging whether a worksheet is appropriate for use with a certain target group. For this reason, the three differing processing modalities (DIF, SEL, CON) used in this material are described below in light of the demands which they make on the skills and abilities of the patient. Questions pertaining to the level of difficulty of the various modalities are dealt with elsewhere.

Differentiation: The worksheets of this type all have in common that they do not require productive skills on the part of the patient:

W/DIF	N/N	Superordinate/subordinate concept	1.1
Which words fit?		Example: **furniture** beard cupboard meadow chair	

W/DIF	N/N	Superordinate/subordinate concept	1.3
Which word is the collective name for the list of articles?		Example: church **building** house castle villa	

The patient is required to make decisions in accordance with a given explicit (e.g. 1.1) or implicit (e.g. 1.3) lexico-semantic relation. This decision may entail making a positive match to a given term, or deciding between items as in the examples given here. It may, however, involve exclusion, i.e. a negative identification is required:

W/DIF N/N Hyponymy 2.1

Which word does not fit?

Example:
eye
nose
mouth
table
ear

In a third variation on these tasks, the patient must make both a positive and a negative identification:

W/DIF N/N,V,A Concept 5.1

Which words fit and which words do not fit?

Please tick:

	fits	does not fit
Suitcase		
suitcase / luggage	X	
suitcase / gloomy		X
...		

S/DIF N/V Predicative Relations 7.13

Please mark/tick whether the sentences are correct [c] or false [f]:

The socks slip down.	~~[**c**]~~	[f]
The chimney drips.	[c]	~~[**f**]~~
...		

The worksheets often begin with examples. We have dispensed with this practice whenever it is part of the exercise to decide how many items either fit or do not fit, in order that the patient is not given information which is either binding or which aids orientation.

Select: Worksheets of this type not only require receptive differentiation skills, but also the active insertion of given items in a set framework. Various types of SEL worksheets are presented here:

W/SEL	N/N	Superordinate/subordinate concept	1.4

Please put the words into the correct group:

pear/skirt/cat/apple/trousers(pants)/bed/pig/sofa/hare(rabbit)

Animal	**Clothing**
_____	_____
_____	_____
...	...

S/SEL	N/N	Superordinate/subordinate concept	1.13

Please complete the sentences using the words given:

piece of furniture, vegetable, island, drinks, animals, vehicle

Dolphins are said to be very intelligent_____
Scarlet fever used to be a dangerous_____
A motorway is a particularly wide_____
...

Whereas in these examples, target items must be selected from a long list and inserted into a given framework, in the following examples items are to be sorted into matching pairs.

W/SEL	N/N	Diverse relations	1.6

Match the words:

glass, porcelain, tin
plastic, cast iron

frying pan_____
bottle_____
can_____
tea pot_____
bucket_____
...

S/SEL V/N Object Relations 8.18

Please match the words:

the dishes **the kitchen**

The woman mops _____
The woman rinses _____
...

The actual task of the patient in the SEL exercises when processed orally consists of pointing/reading, when the exercises are processed in written form the patient is required to write down the appropriate item.

Construct: In worksheets of this type there are some exercises in which the structure of the prompt leads to an almost automatic selection of certain items,....

S/CON S/A Question-Answer 11.4

What are these things like?

What is a circle like? *round*
What is blood like? _____
What is milk like? _____
...

... there are, however, others in which the internal search process for a suitable item is not controlled, but only triggered.

W/CON N/N,V,A Associative Relations 6.4

What do you associate with the following expressions?

stable: *horses, warm, straw, feed, smell, manure...*
hotel: _____
forest: _____
petrol station: _____
...

A common aspect of worksheets of this type is that they all require productive reactions from the patient - either the writing or naming of items - and that apart from a few exceptions the input consists only of single words.

EVALUATION OF THE LEVEL OF DIFFICULTY

Beyond the factors influencing individual impairment, it is only possible to make unspecific recommendations concerning the effective implementation of this material: a worksheet, for example, should be so selected that the patient is able to complete the exercise, i.e. the number of errors should be considerably less than 50% if the exercise has been 'properly' selected. Often, the processing time does not only depend on the level of difficulty of the task for the patient, but also on syndrome-specific and other factors (e.g. additional neuropsychological disorders). For patients who are subject to reduced monitoring, it is often advisable to increase the processing time of an exercise, e.g. by introducing additional processing steps. Several modalities can be employed for the same exercise, or the exercise may be cut into smaller parts. It is often beneficial to complete the exercise first in individual therapy with the support of the therapist, and subsequently to process the task alone. Particularly for patients with limited access to monitoring, the written orientation of the material provides good opportunities for activating feedback and control mechanisms which can then often be supported by intervention from the therapist as described.

Although the order of the word / sentence or receptive / productive modalities in the various chapters corresponds, to a certain extent, to an increasing linguistic complexity, there are so many other factors involved in the assessment of the level of difficulty of a task for a particular patient - which may or may not be linguistic - that we wish to warn against interpreting the order of material in this book as a reflection of the level of difficulty of the individual worksheets. As any such evaluation is of little relevance without consideration of the syndrome-specific and individual disorder profile, we have omitted any such reference in the worksheet designation. Corresponding directions concerning the suitability of certain exercises for certain target groups are, however, contained in the comprehensive description of the material in the last section of this handbook, where an attempt has been made to characterise the tasks linguistically and pragmatically.

Two points should be made concerning the level of difficulty of the 'WORD' and/or 'SENTENCE' worksheets: the solution to many of the so-called 'WORD' worksheets can also be successfully arrived at using a key-word strategy, in other words, there is no need for syntactic processing. The material description contains appropriate directions. Furthermore, due to the influence of other factors on the level of difficulty, many 'SENTENCE' worksheets are, 'easier' to process than certain 'WORD' worksheets - examples of such factors are, the category of word required, the complexity and frequency of the lexical material, how central the lexico-semantic relation in question is, as well as many extra-linguistic factors. Therefore, having taken into account the individual disorder profile, there is little point in characterising the level of difficulty with specific reference to the 'WORD'-'SENTENCE' worksheets.

We would also advise against making general judgements regarding the complexity of the various processing modalities. It would be an error to assume, for example, that the worksheets of type SEL should be regarded as being easier than those which require a

higher level of language production (type CON): experience shows that some patients (especially Wernicke aphasics with severe receptive disorders) have more difficulty with the mapping of internal decision-making processes on SEL-tasks than in free naming tasks or writing down the solutions found. In addition, there are task-specific difficulties with the actual processing of the SEL worksheets which entail jumping back and forth between various lines. This should be taken into account when treating patients with apraxia, or those with visuo-cognitive impairments. It is possible and sometimes advisable to change worksheets of type SEL into CON worksheets by blocking out or separating the prompts.

On the other hand, when using worksheets of type CON, as well as taking into account the nature of the word-finding exercise, it is important for the evaluation of the level of difficulty of an exercise for a certain patient, to consider the phonematic/graphematic complexity of the target words. We have attempted to include these aspects in the material descriptions.

PRINCIPLES AND POSSIBILITIES OF COMBINATION

Of course, no limits should be set concerning the manner in which the materials can be combined! Nevertheless, a few variation and combination principles have been systematically incorporated into the material and these should be exploited during therapy:

1) Many of the worksheets appear in several versions (in most cases consecutively) and although the task to be performed is common to all, they differ with respect to complexity and the combination of the items employed e.g. in the following examples in which the proximity of the distractor is varied:

W/DIF	N/N	Hyponymy			2.1/2.2
Which word does not fit?		chair table **~~party~~** cupboard sofa	**vs.**	cupboard bed table **~~oven~~** chair	
...					

In contrast, in the following examples, which have a common task, we used in one case concrete nouns and in the other abstract nouns as stimulus material:

W/CON	N/A	Predicative Relations	7.8/7.9

Find suitable adjectives:

dog	*faithful,...*	vs.	joke	*funny, ...*
house			journey	
...				

A further example demonstrates variation in the internal complexity of the words. In this case, the identical task must be performed but with either simple nouns or with composite nouns as the stimulus items:

W/DIF	N/A	Predicative Relations	7.1/7.2

Which words fit?

sofa	clever	modern	comfortable	wide
vs.				
fruit salad	fruity	refreshing	bitter	sweet
...				

2) In those chapters in which the focus is on either a verb-noun or a noun-verb relation, there are often 'reverse versions' of the same task, i.e. the semantic relation is viewed in one case from the perspective of the verb, and in the other case from the perspective of the noun:

W/DIF	N/V vs. V/N	Object Relations	8.2/8.3

Which words fit?

flowers	to water	to fertilise/fertilize	to give	to shower
vs.				
to water	plants	flowers	rubber tree	bus
...				

The same principle has been employed in the corresponding sentence worksheets:

S/SEL V/N vs. N/V Object Relations 8.18/8.22

	the cows / **the chickens**	
The farmer milks	_____	
The farmer plucks	_____	
vs.		
	fertilise(fertilize) / **feed**	
The farmer must	_____	the cows.
The farmer must	_____	the fields.

3) If we consider the last two examples under a different aspect, it is evident that within the same semantic relation it is possible to select combinations of word and sentence tasks as required, or to prepare the step from word to sentence processing using the same task/method and with only slight variations in the lexical material. These variations can also be employed effectively for diagnostic control. Another example of variation on the word/sentence axis is given below:

W/DIF vs. S/DIF N/N,V,A Concept 5.3/5.7

Armchair	fits	does not fit
armchair/comfortable	X	
armchair/backrest	X	
armchair/bitter		X

vs.

In an **armchair** you can	bathe	crawl	**sit**
A good armchair has	doors	**cushions**	leaves
An armchair is	an animal	**a piece of furniture**	a shoe
...			

4) A gradually increasing level of competence in a lexico-semantic relation or word category can often be achieved effectively by means of a selected ‘consecutive application’ of the various processing modalities, as demonstrated in the manner in which we have organised the internal structure of the individual chapters. Such a row could, for example, consist of the following worksheets from the chapter on predicative relations:

W/DIF	N/A	Predicative Relations			7.1

Which words fit?

violet wilted beautiful delicate tired
...

W/SEL	N/A	Predicative Relations	7.5

Match the pairs of words:

efficient, kind, elegant,...

lady _____
priest _____
businessman _____
...

S/SEL	N/A	Predicative Relations	7.19

funny, accurate, windy, keen/eager, deep, strong,

The weightlifter is very _____
The clear mountain lake is very _____
The children thought the clown was very _____
...

S/CON	N/A	Predicative Relations	7.20

The schoolchildren are hard-working and *attentive*
The weekend was warm and _____
The Indians were brave and _____

5) It is sometimes effective to build chains of worksheets which are selected from different sections of the therapy material, e.g. using word categories as a basis. If, for example, the therapeutic objective is to stabilise the use of adjectives, then worksheets from completely different chapters must be combined. In addition to those shown in the preceding section and others from the chapter on predicative relations, worksheets from the chapters on similarity of meaning, associative relations

and question-answer could also be included.

All these material combination possibilities should aid the therapist to tailor the therapy to the individual requirements of the patient and also to monitor the therapeutic success (e.g. transfer effects between various modalities) and so, with the help of the therapy material, to enable him/her to make a diagnostic evaluation of the status of the patient.

THE CORRECTION OF MISTAKES

As we do not impose any concept of learning theory on the therapeutic process, we do not adhere to a 'pedagogically-oriented' treatment of the patient. In order to be able to help a patient by means of 'correction' or directions concerning 'mistakes', considerable therapeutic experience is required. If the patient makes very many mistakes or if he/she wrestles too long with the task in hand, then this task should be exchanged for another: the therapist has made a mistake. Requests from the patient for 'easier' material should certainly be taken seriously by the therapist.
Depending on the syndrome, impairment awareness, accompanying neuropsychological disorders and psychic stability, it may be considered beneficial to accept all erroneous solutions from the patient without comment. It is often advisable to point out the existence of mistakes without specifying them in order that the patient reviews the exercise and if possible corrects him/herself; however, the ability of the patients in question to self-correct is also frequently severely impaired due to severe receptive disorders. On the other hand, some patients benefit when the therapist individually names, explains and corrects all mistakes.

In principle, we are of the opinion that healthy speakers also do not have introspective access to the unconscious and automatic processes involved in language processing. They do, however, possess internal control systems, with whose help they are able to ascertain whether the output of these processes exhibits deficits and requires correction. It is exactly this monitoring ability which is missing in most patients and especially in Wernicke aphasics, and as a result the conditions for successful self-correction are also not in evidence. For this reason, we maintain that too much explicit correction by the therapist harms rather than helps these patients.

EVALUATION OF THE MATERIAL

Within the context of clinical practice and over a period of several years the team of authors developed, employed, revised, rejected and improved the material presented here. From a very much more extensive range of worksheets, the ones which have proved most indispensable were selected and systematically re-worked under various aspects: the linguistic relevance of the tasks, the degree of linguistic control in the items, the uniformity of the instructions - these are only a few of the points which were borne in mind. In

order to achieve more balance, for instance in relation to the levels of difficulty, a number of new worksheets were developed to augment the present collection of materials, naturally using the time-proven format of the existing materials as our basis.

The German version of *Word- and Picture Semantic Impairments* has been used in Germany and in Austria/Switzerland since 1992 and 1995 respectively, to treat German-speaking aphasic patients. It can be found as standard inventory in every clinical-therapeutic institution that deals with these patients and therefore can be considered successfully evaluated.

DESCRIPTION OF THE MATERIAL

CLASSIFICATORIAL RELATIONS

Classificatorial relations between linguistic concepts are, it is supposed, the central organisational principle according to which our semantic lexicon - or the semantic subsystem of our mental word memory - is structured. These hierarchical relations define the basic connections between the individual concepts and participate in the determination of the degree of semantic similarity which exists between words. Accordingly, many semantic defects in aphasic patients can be explained as the results of a disintegration of this hierarchical structure or of the corresponding activation processes in actual speech processing, irrespective of syndrome, severity and modality. Deficits within the system as well as impairments in the retrieval of semantic concepts lead to a condition of meaning processing in which precise semantic differentiation is no longer possible. Experimental data appear to suggest that a large part of semantic paraphasias which can be observed in the speech behaviour of aphasic patients arises in this manner, however, with respect to the classificatorial relations involved certain involved certain regularities must be considered: the most frequent involve the confusion of hyponymic terms, i.e. words which have a common superordinate concept and which perhaps also share numerous pieces of semantic information. Moreover, it has also been observed that the superordinate concept may be used instead of the intended subordinate concept, and vice versa. A third category of classificatorial paraphasias is that in which a word is employed which exhibits a Part-of Relation to the intended word, or vice versa. In general, it is true of all forms of semantic paraphasias that a) the prototypical elements of a semantic field tend to be better preserved or more easily accessible than those which are less typical, b) in the case of untypical elements, basic concepts are frequently substituted for concepts, and c) the frequency of use of a word influences its availability.

If so many semantic paraphasias can be understood as impairment of the hierarchical structure of semantic concepts, then a therapy for lexico-

semantic disorders must have as its objective systematically to rebuild, stabilise or de-block the classificatorial relations which define these hierarchies. The material presented here focuses on the basic hierarchical relations between nouns, viz. the relations superordinate/subordinate, hyponymy and Part-of Relation. The variables frequency of use and prototypicality were taken into account in the selection of the lexical material (which does not imply that only frequent and prototypical nouns were employed).

1 SUPERORDINATE/SUBORDINATE CONCEPT

The chapter contains 13 WS, of which 11 relate to the word level and 2 to the sentence level. 10 WS deal exclusively with superordinate/subordinate concepts, 3 place them in the context of other semantic relations (1.6, 1.7, 1.12). In terms of processing modality, 4 deal with the type DIF, 5 with SEL, and 4 with CON; the spectrum of difficulty ranges from very easy to difficult, i.e. there are exercises for patients with the most severe word memory disorders, but also for those with less severe word-finding impairments. The lexical material employed consists of (in most cases simple) concrete terms which are used relatively frequently and which are prototypical; only in the CON WS 1.11 and 1.12 are less frequently used and less typical terms employed - this is due to the nature of the exercises.

W/DIF	N/N	Superordinate/Subordinate Concept	1.1

FURNITURE

beard
cupboard
meadow
chair

For each superordinate concept given, the two suitable subordinate concepts must be selected from a group of 4 words; the terms which do not fit have no semantic connection to the target words.

This work sheet is suitable as an introduction to the therapy of severe lexico-semantic disorders.

W/DIF	N/N	Superordinate/Subordinate Concept	1.2

TOY

ball
fringe
ruler
doll

This task is similar to 1.1 except that the terms which do not fit to the superordinate concept have a semantic connection to the target words: in each group, one of the distractors is a subordinate concept of a related superordinate concept (ruler), the other is also linked via classificatorial relation to at least one of the appropriate subordinate concepts, viz. Part-of Relation (fringe).

W/DIF	N/N	Superordinate/Subordinate Concept	1.3

church
building
house
castle
villa

The superordinate concept should be identified from a group of 5 terms. The exercise is especially directed towards the de-blocking or the rebuilding of the hierarchical organisation of semantic knowledge which is particularly affected in severe lexico-semantic disorders.

W/SEL	N/N	Superordinate/Subordinate Concept	1.4

pear / skirt / **cat** / apple / trousers(pants) / bed / **pig** …

ANIMAL	CLOTHING
_____	_____
_____	_____
_____	_____

…

Frequently used nouns which represent basic concepts should be allocated to the suitable superordinate concept. In principle, this exercise is also designed to be of benefit to patients with severe impairments.

W/SEL	N/N	Superordinate/Subordinate Concept	1.5

plum / butcher / leek / hammer / plate / drill ...

FRUIT	VEGETABLES
_____	_____
_____	_____
_____	_____

…

As 1.4 but more difficult, as in each group two of the total of six superordinate concepts exhibit semantic similarity.

W/SEL	N/N	Diverse Relations	1.6 / 1.7

furniture, clothing, crockery(tableware)...

desk:
soap:
suit:
...
...

Here, the matching task must be accomplished according to diverse semantic criteria, including the matching of superordinate concepts to a suitable subordinate concept.

W/CON	N/N	Superordinate/Subordinate Concept	1.8

TREES

oak
pine
birch
sycamore
beech

Superordinate concepts are given together with three subordinate concepts, to which a further two hyponymic terms should be added. This exercise was designed as an easy word-finding exercise.

W/CON	N/N	Superordinate/Subordinate Concept 1.9 / 1.10

cupboard, bed, table ***furniture***

In this exercise, the patient should find the suitable superordinate concept for the three hyponymic terms given. In our experience, this exercise is not ideally suited for patients with severe word-finding disorders, however, each case should be decided individually, especially as the linguistic competence of the patient before his/her illness could be a significant factor.

W/CON	N/N	Superordinate/Subordinate Concept 1.11

poodle ***dog***
birch ***tree***

A subordinate concept should be assigned to each of the terms given; the stimuli have been so chosen that the superordinate term defines a basic concept. This work sheet is suited for therapy in cases of word-finding disorders of moderate severity.

S/DIF	N/N	Diverse Relations 1.12

A window pane is made of granite. correct / **false**.
A tractor is a vehicle. **correct** / false

Here, sentences which express various N/N relations are to be evaluated under the criteria c/f, this also includes sentences in which there is an explicit hyponymic relation.

S/SEL	N/N	Superordinate/Subordinate Concept 1.13

piece of furniture, vegetable, ..., **animals**, ..., ...

Dolphins are said to be very intelligent _____

In this sentence completion task, the superordinate concepts (or general terms) provided are to be inserted at the end of a simple declarative sentence to form a meaningful addition. This exercise is oriented towards the treatment of lexico-semantic disorders of moderate severity. As the stimulus material can also be used for free sentence extension, patients with milder disorders might also benefit from this exercise.

2 HYPONYMY

Experience has shown that hyponymic relations, i.e. the grouping of nouns which have a common superordinate concept, offer a good introduction to the therapy of severe lexico-semantic disorders. For the reactivation or restoration of this lexicon-internal relation a total of 7 WS have been created all of which focus on the word level. 5 of them are of the processing type DIF, 2 are CON; the degree of severity of the exercises ranges from very easy to moderate, so that they are generally suitable for patients who suffer from global or Wernicke's aphasia. The concrete terms used as stimuli are for the most part frequently used simple nouns. In the choice of hyponymic relations which the patient is required to process care was taken to ensure that the terms in question occupied a central position in the semantic field and that they were semantically not too similar to each other (2nd degree hyponymy; Stachowiak, 134ff.) in order not to disturb the boundaries between the concepts unnecessarily.

W/DIF	N/N	Hyponymy	2.1

eye
nose
mouth
~~**table**~~
ear

From a group of five nouns, of which four are hyponyms, the odd term should be identified. The odd term is semantically distant from the other four terms, so that this work sheet is particularly suitable for patients with (very) severe word memory disorders.

W/DIF	N/N	Hyponymy	2.2

church
~~**tent**~~
house
post office
villa

As 2.1, except that the noun which does not belong is a subordinate concept of a closely related superordinate concept.

W/DIF	N/N	Hyponymy	2.3

arm
stomach
foot
~~**coat**~~
shoulder

As 2.1 and 2.2; the word which does not belong has an associative semantic relation to the other words.

W/DIF	N/N	Hyponymy	2.4

chair, bed, ... garden **cupboard** tea

For each hyponymic pair, an additional hyponym should be identified from a group of three nouns.

W/DIF	N/N	Hyponymy	2.5

chair, bed, ... lamp **cupboard** leg

As 2.4; however the nouns which do not fit are distractors (part-of relation or associative relation)

W/ DIF	N/N	Hyponymy	2.6 / 2.7

bag
pouch
suitcase
sack
basket

The patient should add two hyponyms to the three given, although the number of nouns to be found can be varied. This exercise, in our opinion, is particularly suited to the therapy of word-finding disorders of moderate to mild degrees of severity.

3 PART-OF RELATION

The Part-of Relation is a further hierarchical principle of lexical organisation in which the whole is accorded superiority over its parts (e.g. body-head-face-mouth). Among the expressions which can be regarded as part of a whole are some which have a definitional value for a certain nominal concept (such as *steps* for *staircase* or *trunk* for *tree*), that is to say they are concept inherent, whereas others do not belong to the concept of the superordinate term or 'whole' but are optional or even marginal (such as *lid* for *pan*). In the case of nouns which denote parts of something, there are a large number of expressions which are of such a general or abstract character that they can be allocated to many objects in a Part-of Relation (examples are words like *arm, button, clip*), on the other hand there are terms which refer only to a particular part of a particular whole (e.g. *antlers, eaves, brim*). These Part-of Relation characteristics were taken into account in the development of the material so that each of the relations which has to be processed can be allocated to one of the following categories: a) concept inherent, definitional b) optional, marginal. The frequency of use of the expressions in these exercises was accorded less importance than in the two preceding chapters.

There are in total 9 WS, of which 3 focus on the word level and 6 on the sentence level. The distribution of processing modalities is as follows: 1 DIF, 6 SEL, 2 CON. As to the degrees of difficulty, the chapter contains both exercises which are suitable for the therapy of severe or moderately severe word-memory disorders as well as tasks for the targeted stimulation of word-finding skills in milder forms of aphasia.

W/DIF	N/N	Part-of Relation	3.1

CAR	HORSE
motor	mane
wheels	~~**antlers**~~
~~**wings**~~	tail
horn	hoof

Twelve simple nouns (car, horse, ...) are each followed by 4 further terms, 3 are either functional or natural components of the corresponding noun (*motor, wheels, horn/ mane, tail, hoof*), and one is a distractor which is not included in a Part-of Relation to the stimulus noun but rather to a hyponym of the stimulus noun (*wings/(aeroplane)* or *antlers/(stag)*). The item which does not belong should be identified and marked by the patient.

This exercise is suitable for patients with severe word-finding disorders.

W/CON	N/N	Part-of Relation	3.2

fins, scales, gills ***fish***

The patient is shown 3 words (*fins, scales, gills*) which precisely express the central components of an object (*fish*) and from which it is possible to identify the corresponding object. The patient should find and write down or name the target word. The basic concept is almost always obvious, sometimes several solutions may be equally probable (SHIRT or BLOUSE for *button*, *collar, cuffs*). If the patients names suitable subordinate concepts instead of a basic concept (e.g. *pike* instead of FISH), then this deviation is an indication of the existing word-finding problems or of a still incomplete hierarchical structure.

As a result of the considerable deblocking effect of the given triplets, this task is also suitable for patients with severe word-finding disorders.

W/CON	N/N	Part-of Relation	3.3

handle ***door***
drawer _____
stalk _____

A noun is given which is either a natural or functional component of one or more objects (*brim* (hat)/ *handle* (cup, door, broom)). Many of these words are comparatively 'abstract' in as much as it is only possible to visualise them in connection with the objects of which they are 'part' (*frame, key*). The task of the patient is to find a word pair which demonstrates a Part-of Relation. The target words in most cases stand for simple concrete objects.

The objective of this work sheet can be to facilitate, in a linguistic-associative manner, access to simple words which it is possible to visualise. If the patient finds words which are not in a Part-of Relation but exhibit some other semantic relation to the target word, the therapist may elect under certain circumstances to accept this solution. It may be instructive if deviations from the Part-of Relation are particularly systematic and indicate substitution strategies, e.g. frequent completion of the words given to form composita (*key....ring, sail.....boat, collar....bone* etc.). If this is the case, the exercise is not appropriate and another or an easier exercise must be substituted.

This WS is suitable for patients with mild to moderately severe word-finding disorders.

S/SEL	N/N	Part-of Relation	3.4 - 3.7

a hem / **a brim**

A **hat** has _____
A skirt has _____

These work sheets consist of contrasting Part-of Relations between simple objects which are similar (often hyponyms) and either natural or functional components of these objects.
The patient must match the pairs of terms. As syntactic sentence processing is not necessary in order to find the solution, this WS is also suitable for patients who only process at the word level.
This exercise is of use for all patients with moderately severe word-finding disorders.

S/SEL	N/N	Part-of Relation	3.8

..., trailer, ..., **zip(zipper)**, ..., ...

The skirt has a _____

The sentence completion task presented here consists of simple sentences in which the subject provided and the object to be found are linked as a Part-of Relation. In general, the sentences are of a descriptive rather than a definitional character (hornets have a long sting). The patient's task is to select the object nouns from the randomised list and to insert them into the appropriate sentences. Nouns should not be used more than once.
These sentences may be completed without the use of the randomised word list.
This exercise is suitable for patients with moderately severe word-memory and word-finding disorders, also for those with impaired sentence processing.

S/SEL	N/N	Part-of Relation	3.9

countryside, months, **clauses**, ..., ...

The contract contains many controversial _____

This WS is a variation on the previous one (3.8), however, abstract nouns are used here instead of concrete nouns. Seldom used and orthographically difficult words are included (clause, aria, scene).

For most patients, this WS is more difficult than the previous one, however, for patients with impaired word-finding

abilities for concrete terms this exercise may be easier than the preceding one.

NON-CLASSIFICATORIAL RELATIONS

Non-classificatorial semantic relations between words are those meaning relationships which are not organised hierarchically. This can include central, quasi-definitional relations such as those in the semantic lexicon which must be assumed between the noun *lemon* and the adjectives *yellow* and *sour*, but also similarities of meaning as characterised by synonymity (*pinch/steal*) and complementary relations (*hot/cold*) etc. This category also includes terms with intersecting/overlapping meanings (*to cry/sad*) as well as pragmatically linked relations (*to burn/to extinguish*).

4 SIMILARITY OF MEANING

This chapter is concerned with the various meaning relations which are possible between verbs and adjectives. The 9 WS deal exclusively with the word level processing and are divided equally into 3 processing modalities. The target group for these exercises are chiefly patients with mild and moderate lexico-semantic disorders in the recognition or production of verbs and/or adjectives.

W/ DIF	V/V	Similarity of Meaning	4.1 / 4.2

~~to comb~~ / ~~to peel~~
to flower
to ripen
to grow

The patient is required to identify one verb which does not fit from a group of four. The similarity of the verb-triplets is given on the one hand via the shared syntactic features and on the other hand via a strong semantic similarity. The selected items in the two WS are identical, except for the distractors: in 4-1 they are markedly different to the three words which are similar with reference to the two criteria, whereas in 4-2, the distractors were selected from neighbouring semantic fields with the same syntactic features. This WS is therefore considerably more difficult. In general, in both exercises it is often necessary, in order to find the solution, to run through semantic and syntactic restrictions for the selection of possible subject or object nouns in internal linking processes. An approximate understanding of the word meanings is not sufficient, at least in 4-2, to be able to complete the exercise successfully.

This exercise is suitable for patients who have already improved word-memory skills but who have particular difficulties with the correct use of verbs.

W/SEL	V/V	Similarity of Meaning	4.3

to rot, to trot, **to report**, ...

to tell:
to go mouldy:
to crouch:
...

In two groups of words each containing five verbs, the verbs of similar meanings should be paired up.
The verbs pairs are from differing semantic fields. The similarity between the two elements of a verb pair consists of an overlap of their semantic features which is as complete as possible, but which is not totally complete.
This exercise is suitable for patients with mild word-memory disorders and paraphasias or word-finding difficulties with verbs.

W/CON	V/V	Similarity of Meaning	4.4 / 4.5

to cook, to bake ***to fry, to steam***

The patient is required to add suitable verbs to the two verbs which are provided. This very difficult word-finding exercise should only be given to patients who have already acquired a sufficiently ordered word memory and who suffer from mild word-finding disorders. It can be interesting from the diagnostic point of view to observe which syntactic and semantic limits/categories are relevant for the patient: whether he/she places transitive verbs with intransitive, whether he/she observes narrower semantic categories or only takes account of rough situational-referential aspects. Only those associations which exhibit wide semantic deviance should be corrected.

W/DIF	A/A	Similarity of Meaning	4.6

red
yellow
blue
tough

In this exercise, from a group of four adjectives the patient should select the adjective which does not belong. The similarity between the three adjectives

is a result of the fact that they either express various qualities of sensory impressions belonging to one particular channel of perception, as in the example above, or that they are defined via a common nominal context.
A precondition for the implementation of this exercise is an improved word-memory; an approximate understanding of the adjectives is not sufficient for finding the correct solution. In particular, patients who are unsure in the use of this category of words can profit from this WS.

W/SEL	A/A	Similarity of Meaning	4.7 / 4.8

black, clever, murky,...

white:
clear:
dumb:
...

bitter, steep, misty

tart:
juicy:
foggy:
...

In this WS, two groups of five adjectives are provided as stimuli. The patient is required to match pairs of adjectives whose meanings are similar, however, in 4.7 the pairs consist of antonyms and in 4.8 they exhibit different similarity relations which the patient must find for him/herself. For this reason exercise 4.8 is considerably more difficult than 4.7, especially as the words in the latter WS consists exclusively of simple adjectives of high frequency. As a result, these two exercises have different target groups: in contrast to 4.8, exercise 4.7 is suitable for moderately severe word-memory disorders.

W/CON	A/A	Similarity of Meaning	4.9

sweet, bitter, ... ***salty, tart**, ...*

In this word-finding exercise the patient is given two adjectives with similar meanings to which he/she should add one or several more. This extremely difficult WS should only be presented to patients who have shown that they can cope with exercises 4.6 to 4.8 without problems. A further condition for the efficient processing of this task, is the ability of the patient to remain within the adjective category during the word-association activity. This requires a high degree of internal stability within the word category.

5 CONCEPT

The WS in this section should contribute towards either activating/reactivating the central semantic features of nominal concepts, or, to stimulate the concept in question via the provision of central semantic aspects. There are a total of 10 WS in this chapter, 9 of which are concerned with the DIF modality; the tenth is a word-finding exercise of the CON type. 7 WS deal with the word level and 3 with the sentence level. The exercises are designed for use in severe to moderately severe impairments in the processing of nominal concepts.

W/DIF	N/N,V,A	Concept	5.1 - 5.6

SUITCASE	fits	does not fit
suitcase / luggage	X	
suitcase / gloomy		X
suitcase / to pack	X	
...		
...		

For this series of work sheets we have selected 12 simple nouns which represent basic concepts (suitcase, dog, rose etc.). Eight words have been allocated to each noun, 5 which match and 3 which do not. As these matching words comprise 3 nouns (superordinate concept, Part-of Relation, situational-referential similarity), one verb (typical function, transitive or intransitive) and an adjective (characteristic attribute), the central aspects of the target word concept should be covered. The 3 non-matching terms, from differing word categories, have no semantic connection to the stimulus term.

The patient is required to decide whether or not there is a positive semantic relation for each word pair and to mark as appropriate.

The aim of the work sheets is to activate the hierarchical structure, the most important cornerstones in central semantic relations and the approximate boundaries of central nominal terms, i.e. the ‘concept’ as a whole, for patients with severe impairments. In addition to their therapeutic value, these worksheets often fulfil a diagnostic function by revealing deficits in particular word categories as well as special weaknesses in individual semantic relations or in individual concepts.

These exercises are suitable for patients with severe word-memory disorders (patients with severe apraxia may, however, have difficulties completing these tasks).

S/ DIF	N/N,V,A	Concept	5.7 - 5.9

Many suitcases are made of paper **leather** milk
A suitcase must be plucked bound **packed**
...
...

The objective of this sentence completion exercise is similar to that in the preceding series 5.1 to 5.6, and it employs the same items. Five mainly definitional sentences are given which relate to a basic concept term. The words which fit to the stimulus words must be selected from a group of 3 given words. The distractors have been so selected that one of them fulfils the function in question but for a neighbouring concept. The second distractor is in no way similar to the target term.

This WS promotes the deeper understanding of basic concepts; the exercises are appreciably more difficult than the preceding ones.

These exercises are suitable for patients with word-memory disorders who managed to complete exercises 5.1 to 5.6 without undue difficulty and who are able to deal with sentences (although precise sentence processing is in most cases not required).

W/CON	N,V,A/N	Concept	5.10

fruit, yellow, sour ***lemon***

Here, word-finding ability for simple, frequently-used nouns can be deblocked by providing three central aspects related to the concept in question which together form a strong stimulus for the association of the target word. A decisive factor in the selection of the words given was their central role in the ability to identify the target word: the words are therefore taken from different word categories and some have a close semantic relation to the target word and some have a close situational-referential relation.
This exercise is suitable for patients with moderately severe to severe word-finding disorders.

6 ASSOCIATIVE RELATIONS

Meaning relations of this type are first and foremost pragmatically defined and are mainly concerned with the periphery of the word meaning, rather than the core. Two of the eight WS in this chapter focus on the intersecting/overlapping meanings between a verb and an adjective; a third deals with the diverse relations between nouns. All three WS deal with the word level; one is of type DIF, and the other two of type SEL. These exercises are suitable

above all for patients with severe to moderately severe disorders.
The remaining five WS are all of type CON. They deal with word-finding exercises which are designed to activate/reactivate the above-mentioned associative semantic relations.

W/DIF	V/A	Associative Relations	6.1

TO CRY happy **sad** high

The patient is required to identify one adjective from a group of three whose meaning overlaps with the meaning of the stimulus verb. This relation between the two words, sometimes an implication-similar relation, is decidedly close. One of the two distractors is usually an antonym of the target word, the other is an adjective which is only remotely connected to any of the other words.
The objective of this exercise is to make the prominent sensory quality expressed in the intransitive verbs provided accessible to the patient.
This exercise is suitable for patients with moderately severe to severe word-memory disorders.

W/SEL	V/A	Associative Relations	6.2

sad, bright, sharp, ..., ...

to prick:
to cry:
to glow:
...
...

As in exercise 6.1, adjectives should be matched with verbs, and some of the stimulus material provided here is identical with that in the previous exercise. There are, however, some transitive verbs in this exercise. The criterion for the correct matching in each case is a characteristic feature or quality which is central to the process or activity expressed by the verb. The exercise should only be given to those patients with moderately severe disorders who already have stabile word comprehension skills.

W/SEL	N/N	Associative Relations	6.3

refrigerator, shelf, drawer, ..., ...

book:
car:
butter:
...
...

In this exercise the patient's task is to find matching word pairs from two groups each containing five nouns. The items given are sometimes simple, however, there are some words which are orthographically more demanding (scythe, restaurant, secretary) as well as infrequently-used words (discotheque, harvest festival).

In this WS there are situational-referential relations of different kinds between nouns.
Due to the item-complexity, this exercise is for the most part not suitable for patients with severe disorders, but rather for those with moderately severe impairments.

W/CON	N/N,V,A	Associative Relations	6.4 / 6.5

STABLE: ***horses, warm, straw, feed, smell, manure....***

VISIT: ***to invite, coffee and cake, to chat, relaxing atmosphere,...***

In these two WS the patient is required to add (by association) as many terms as possible from different word categories. The stimuli have been selected so as to ensure that there are as many semantic associations as possible. Exercise 6.4 consists exclusively of concrete nouns and 6.5 contains only abstract nouns.
These exercises were conceived for patients with mild word-finding disorders, who are already able to employ their own imagination and mental pictures to form associations.

W/CON	N/N	Associative Relations	6.6 - 6.8

What's in the washing/laundry basket? ***shirts, trousers, table-cloths, bed-linen, underclothes, blouses, dress, ...***

The question prompt defines an everyday spatial concept to which the patient - with moderately severe to mild word-finding disorders, should add as many nouns as possible by association. The therapist may, however, modify the task such that the patient is only required to provide one or two additional terms, in

which case the question prompt functions as a stimulus which demands reactive naming skills.

PROPOSITIONAL RELATIONS

The term propositional relation refers to all those semantic relations which (can) exist between a noun and a predicative term of the verb or adjective category. The spectrum of such meaning relationships ranges from central, i.e. the semantic core of a nominal concept, to peripheral, where the pragmatically motivated and the idiosyncratically founded semantic information is located, and this is naturally where the greatest intersubjective variance is exhibited.
The fact that such non-hierarchically organised information is psychologically real too, i.e. it plays a role within the lexico-semantic representation and/or processing systems, is shown on the one hand by the large group of so-called situational-referential paraphasias with their various degrees of semantic proximity and their different but nevertheless non-classificatorial semantic relationship to the target word, and on the other hand it is evident from the systematic nature of the circumlocutions with which aphasics typically characterise the meaning of a word which is not available to them at that moment.

7 PREDICATIVE RELATIONS

In this chapter we have included all those semantic relations in which the noun, implicitly or explicitly, is understood as the logical subject. This comprises the following three relations: noun/intransitive verb, noun/adjective, and those noun/noun relations which linguistically reflect the relationship between an object and its material composition (e.g. barrel/wood).

There are a total of 21 WS which deal with the processing modalities as follows: 8 DIF, 8 SEL, 5 CON. The ratio between word and sentence level exercises is 9 : 11. This rather extensive chapter contains exercises for patients with severe to moderately severe lexico-semantic impairments in language comprehension, as well as WS which can be used for the therapy of word-finding disorders for patients who suffer from moderately-severe to mild aphasias. As a consequence, the lexical material employed varies with reference to the frequency, length and complexity of the processing units.

W/DIF	N/A	Predicative Relations	7.1

VIOLET **wilted** **beautiful** **delicate** loud

From a row containing four adjectives, those three should be identified which describe a characteristic or a possible quality of the noun given. As the requirement for the processing of this WS is, above all, the understanding of (simple) nouns, this exercise is aimed at the treatment of severe word-memory disorders.

W/DIF	N/A	Predicative Relations	7.2

FRUIT SALAD **fruity** **refreshing** bitter **sweet**

As 7.1, however, compound nouns are used here in place of simple nouns, and some of the adjectives which have been selected are structurally more complex. In addition, the adjective which does not fit is similar in meaning to one of the three matching adjectives, which increases the level of difficulty of this exercise compared with 7.1. This exercise is suitable for patients with moderate to mild disorders.

W/DIF	N/V	Predicative Relations	7.3

WATER **to flow** to laugh **to drip** **to roar**

From a row of four intransitive verbs, the three which exhibit a relatively close predicative semantic relation to the corresponding simple, concrete noun should be selected. The exercise requires the comprehension of the noun given, however, this task is suitable for patients with severe lexico-semantic disorders. By leaving open the selection of the solutions to each of these 3 worksheets, the therapist can vary the degree of difficulty of the exercises.

W/SEL	N/A	Predicative Relations	7.4

hot, **spicy**, friendly, …

paprika:
girl:
fire:
…

Groups of five adjectives and five semantically distinct nouns are given. The task is to match each adjective to that noun for which it expresses a characteristic quality.

Primarily, this exercise is suitable for patients with moderately severe impairments, however, in some cases this exercise can certainly be of benefit to patients with severe disorders.

W/SEL	N/A	Predicative Relations	7.5

efficient, kind, **elegant**, ...

lady:
businessman:
priest:
...
...

As 7.4, however, in this exercise the adjectives and the nouns exhibit a similarity of meaning within their respective groups, making this task clearly more difficult than the previous one. In order to be able to process this exercise efficiently the patient should therefore exhibit a less severe level of impairment. This exercise focuses on the ability to make fine distinctions between semantically similar adjectives.

W/SEL	N/V	Predicative Relations	7.6

to snarl, **to drone**, to glimmer/blaze, ...

organ:
after-shave lotion:
fire:
...
...

From sets of five intransitive verbs and five nouns matching pairs should be found. As the meanings are very specific the exercise is not suitable for patients with severe lexico-semantic impairments.

W/CON	N/V	Predicative Relations	7.7

HORSE ***to neigh, to graze, to trot, to gallop, ...***

By means of association, intransitive verbs should be found which describe characteristic actions of the object in question. As the number of verbs to be found can be determined by the therapist, this exercise is also beneficial for patients with severe word-finding disorders.

W/CON	N/A	Predicative Relations	7.8

DOG ***faithful, large, hairy/shaggy, playful, ...***

Here, suitable adjectives should be found which describe possible and the most typical qualities of the object in question i.e. simple, concrete nouns. This exercise can also be used for the treatment of severe word-finding disorders, as the therapist can determine how many adjectives are to be found and how characteristic they must be.

W/CON	N/A	Predicative Relations	7.9

JOKE ***funny, tasteless, bad, ...***

As 7.8, however, abstract nouns are used in this exercise, which increases the degree of difficulty and correspondingly modifies the target group.

S/DIF	N/A	Predicative Relations	7.10/7.11

Thunder is
bright
loud
quiet

The task is to select the suitable extension from the three adjectives given. The target word describes an invariant (i.e. concept inherent) quality of the noun. As this exercise does not require sentence processing it can be used for the therapy of severe semantic disorders.

S/DIF	N/V	Predicative Relations	7.12

The bird melts.
The bird sings.
The bird barks.

From a group of three sentences with an identical subject, the semantically correct sentence should be identified. The selection is made via the meanings of the three (intransitive) verbs; the verb in the target sentence is similar in meaning to one of the other verbs. In our experience, this exercise can be given to patients with moderately severe disorders, as long as their word comprehension for the nouns employed is sufficiently stable.

S/DIF	N/V	Predicative Relations	7.13

The socks slip down. **correct** / false
The chimney drips. correct / **false**

Short sentences, which comprise a noun and an intransitive verb, should be evaluated with respect to their semantic plausibility. This task will almost certainly be beyond the abilities of patients with very severe disorders.

S/DIF	N/V	Predicative Relations	7.14

The travel report impressed the publisher. **correct** / false
The earthquake made the town more attractive. correct / **false**

Sentences with inanimate subjects should be evaluated with respect to their semantic plausibility. Due to the lexico-semantic complexity of the linguistic material employed, this exercise is certainly not suitable for patients with severe disorders and only to a limited extent suited to those with moderately severe disorders.

S/SEL	N/N	Predicative Relations	7.15

wood / tin

The **barrel** is made of _____
The bucket is made of _____

Pairs of sentences in which the subject nouns are semantically similar (hyponyms), are to be competed using the extensions provided. The relation which is expressed in these sentences is the relation between an object and the material of which it is made. As the exercise format involves pairs of sentences, the correct solution is attained even if only one of the sentences is correctly completed (as the second answer is then automatically given), and for this reason this exercise can be given to patients with severe disorders. In addition, an understanding of the nouns is sufficient to enable the solution to be found.

S/DIF	N/N	Predicative Relations	7.16

silver / rubber / wax / …/ …/ **wood** / …

Shelves are made of_____
Buckets are made of_____
…
…

A central characteristic of many objects is the material from which they are made. Using this criterion only, the nouns provided should be inserted into short sentences. An unimpaired ability to process sentences is not necessary in this case. For this reason, and also because the exercise is not very demanding in terms of orthography, this WS is also suitable for patients with severe word-memory disorders.

S/SEL	N/A	Predicative Relations	7.17

white / black

Snow is_____
Coal is_____

Here, each of a pair of adjectives (antonyms) has to be inserted into a sentence; in each case the adjective describes an inherent semantic quality of the subject noun. The same considerations are valid here as in 7.15, certainly with respect to the error probability in contrasting word-pairs.

S/SEL	N/V	Predicative Relations	7.18

rolls / flutters

The **teardrop**_____
The flag_____

Pairs of semantically very similar (mostly intransitive) verbs should be inserted into gaps in sentences. The verbs describe a characteristic action of the subjects which have been selected. As the stimuli are presented in pairs, the correct answer to one of the sentences leads automatically to the correct answer for the other. Nevertheless, this exercise is not suitable for patients with very severe impairments due to the semantic similarity of the noun-pairs and verb-pairs.

S/SEL	N/A	Predicative Relations	7.19

funny / accurate / ..., / **strong /** ...

The weightlifter is very_____
...

In this exercise, sentences (in most cases copula structures) have to be completed using one of the adjectives listed. Adjectives may be used more than once. The relation between the subject noun and the adjective is generally not concept inherent, and in addition to the obvious solution there may be other sensible extensions. In terms of difficulty, this WS is suitable for those patients suffering from moderately severe lexico-semantic disorders who are able, form the syntactic point of view, to process sentences of this complexity correctly in most cases.

S/CON	N/A	Predicative Relations	7.20

The schoolchildren are hard-working and_____***attentive..***___

In this exercise the patient is required to find a second adjective which completes the copula structure. Although relatively high demands are placed on word-finding competence - not least as a result of the word type, in many cases the adjective provided in the sentence helps in search for a second adjective. This adjective can be similar in meaning to the first or be related by association; often there is a quality which is so closely linked to the first adjective, that the first induces the second. We have found that this exercise can be of benefit to patients who have moderate to mild word-finding disorders, as long as they are sufficiently able to deal with the sentences, lexically and structurally, which have to be processed.

S/CON	N/V	Predicative Relations	7.21

Their mother would like to_____***go on holiday/vacation.***___

In this WS the patient can freely select the extension to the sentence. The whole VP should be inserted, however, the patient is given no instructions regarding the structural and lexico-semantic complexity of these constituents. The lexical material contained in the first part of the sentence has been constructed so that the semantic context is chiefly neutral.
In our experience, only those patients who suffer from mild word-finding disorders are able to complete this exercise 100% correctly, however, with appropriate support from the therapist, aphasic patients with more severe disorders may be able to complete some

of the sentences.

8 OBJECT RELATIONS

This chapter deals with all those noun-verbs relations in which the noun is interpreted as a logical object of the activity expressed by the verb. The 31 WS contain therapy material with stimuli of appropriate complexity for all grades and types of impairment. In terms of processing modalities, there are 13 WS of type DIF, 8 of type SEL, and 10 which belong to the category CON; the ratio between word and sentence level is 9 : 22.

W/DIF	N/V	Object Relations	8.1

HAIR to sing **to cut** **to wash** **to comb**

From a row of 4 verbs, the three which are semantically related to the preceding simple, concrete noun should be identified. The noun is in each case a term which is a possible object of each of the three correct verbs. The verb which does not fit has no semantic relation either to the other three verbs or to the noun in question. This exercise can be given to all those patients whose comprehension of simple concrete nouns is intact.

W/DIF	N/V	Object Relations	8.2

HAIR to clean **to cut** **to wash** **to comb**

In terms of lexical material, this exercise is identical to 8.1, except that here the word which does not fit is semantically related to at least one of the other three verbs. This exercise is therefore more difficult than 8.1 and should make the patient aware that a semantic similarity between the verbs does not necessarily lead to the same plausible verb-object relation.

W/DIF	V/N	Object Relations	8.3

to water **plants** **flowers** **rubber tree** bus

This WS is the inverse of 8.1 and 8.2, in this case three objects must be matched to a verb. Three of the nouns fit, the fourth has no semantic relation with the other words.

W/DIF	V/N	Object Relations	8.4

to water **plants** animals **flowers** **rubber tree**

This exercise is identical to 8.3 except that the noun which does not fit is a distractor which belongs to a neighbouring semantic field, but which is not a possible object of the verb in question.

W/DIF	V/N	Object Relations	8.5

to close	**book**	**door**	word
	deal	potato	**eyes**

From a group of six semantically distinct nouns, four should be selected which are related to the verb given. The verbs have a relatively wide range of meanings. Each of the verb-object relations results from a different aspect or reading of the verb meaning, some have a quasi-idiomatic character. This exercise is therefore suitable for patients with moderate to mild language comprehension disorders.

W/DIF	V/N	Object Relations	8.6

Daisies, hamster, pot, ...

to build:
to pick:
to rinse:
...

A group of 5 semantically dissimilar verbs and a group of 5 equally distinct nouns are given. The task is to find that noun which is a possible object to the verb in question. In light of certain aspects of the stimulus material used here (e.g. complexity, frequency) the exercise is especially suited for patients with disorders of moderate severity.

W/CON	V/N	Object Relations	8.7

eat ***soup, bread, apples, fish, ...***

Nouns should be found, by association, which serve as possible objects for the (frequently used) verbs given; due to the nature of the verb meanings, the nouns share certain semantic qualities. This exercise was developed for pa-

tients with severe to moderate word finding disorders.

W/CON	V/N	Object Relations	8.8

order ***food, beer, newspaper, furniture, ...***

This exercise is analogous to 8.7 except that the verbs given have both a more complex internal structure and a wider and often more unspecific range of meaning than the verbs in 8.7. These factors increase the general level of difficulty.

W/CON	V/N	Object Relations	8.9

to report ***accident, thief, crime, colleague, ...***

This worksheet, which is of the same type as the preceding exercise, is more difficult in that it requires that abstract nouns be found to fit the complex verbs. This exercise should therefore only be used with patients who have mild word finding disorders.

S/DIF	V/N	Object Relations	8.10

The man waters... **the roses**
the animals
the flowers

Simple SVO sentences are given, for which suitable objects must be selected. For each sentence three objects are provided, of which two can be used to complete the sentences meaningfully and the third is semantically related to the other two nouns but is not a possible object for the verb in question. Of the ten transitive verbs in this exercise, five can also be used intransitively. As this exercise can only be completed by analysing correctly the verb meanings, and as the therapist can determine whether one or two of the nouns must be found, this exercise can also be given to patients with severe disorders.

S/DIF	V/N	Object Relations	8.11/8.12

The mother serves the ...

knitting
customer
children
goblet

As in the previous exercise, simple SVO sentences should be completed. The object NPs to be selected are constructed according to the following principle: one is semantically and pragmatically proximate, one is semantically possible but pragmatically less plausible, one NP has an associative relation to the subject noun and one has no meaning relation at all with any other word in the sentence. The verbs used all require the addition of a direct object (= accusative NP) and can not be used intransitively.

The therapist is also able in this exercise to vary the nature of the processing. According to the individual nature and severity of impairment, the therapist can decide whether both NPs should be found or if one is sufficient. The target group is therefore the same as in 8-10, however, there is here an additional source of error due to the distractor which is related to the subject but which is not a possible object. If these nouns are systematically selected then the patient ignores the structural and/or semantic function of the verb in the sentence context, i.e. this exercise is still too difficult for the patient.

S/DIF	V/N	Object Relations	8.13

The pope blesses the pilgrims. **correct** / false
The boss smokes a salami. correct / **false**

In this exercise SVO sentences with animate subjects and inanimate objects should be evaluated with regard to their semantic plausibility, and identified as either correct or false. The correct sentences have a high degree of semantic-pragmatic plausibility; the incorrect sentences are so constructed that (at least in on-line processing) the subject-verb sequence implies that a noun from a certain semantic field be used as object. Instead, a noun with quite different semantic properties appears in this position and the processing-induced assumptions concerning the meaning of the object are systematically disturbed. Thus, this exercise is designed primarily to promote the correct and complete semantic analysis of sentences according to the conditions of linear processing and this analysis is not necessarily linked to a particular degree of severity of lexico-semantic impairment.

S/DIF	V/N	Object Relations	8.14

The brass band played a march. **correct** / false
The violinist plays a verse. correct / **false**

This exercise also concerns itself with the evaluation of semantic plausibility of sentences. In contrast to 8.13, the object-nouns in the incorrect sentences have been chosen so that they are a possible object of a semantically related verb and also that they have an associative relation to the subject, which may, however, be vague. The evaluation of the incorrect sentences in particular is therefore the result of a semantically differentiated analysis of the verb and requires, under certain circumstances, a semantic re-evaluation. This exercise is therefore not suitable for patients with severe disorders.

S/DIF	V/N	Object Relations	8.15

The fire destroyed the harvest. **correct** / false
The orchestra accompanies the stage. correct / **false**

This exercise also requires an evaluation of SVO sentences according to semantic-pragmatic criteria. In principle, this exercise corresponds to 8.14, however, some inanimate subjects have been selected and the words used are decidedly more complex structurally and lexically.

S/DIF	V/N	Object Relations	8.16 / 8.17

The holidaymakers/vacationers sit comfortably under the sunshade and enjoy the summer weather. **correct** / false

The bus stopped at the doorstep and waited for more passengers. correct / **false**

This exercise, which also concerns sentence evaluation, deals with the plausibility of complex declarative sentences. The sentences which are semantically incorrect can be identified only by accurately analysing the compound nouns in the object position; only one part of the compound expression deviates (minimally) from that which is expected or required from a semantic analysis of the sentence context.
As well as the complexity of the lexical terms employed in this exercise there are additional sources of difficulty in the structural complexity of the constituents - their length and the overall length of the sentences - which require a detailed and comprehensive analysis on the part of the patient. This exercise is

therefore only suitable for patients with mild language comprehension disorders.

S/SEL	V/N	Object Relations	8.18 - 8.21

the dishes **the kitchen**

The woman **mops** _____

The woman rinses _____

In this series of worksheets pairs of simple SVO sentences are given for which suitable object NPs should be found. The subjects are in each case identical and the verbs semantically close, and the object nouns are semantically related, although not always closely. Due to the nature of this pairing exercise, the correct processing of one sentence automatically produces the correct solution for the other sentence. In addition, this exercise can also be solved using a canonical processing strategy, i.e. a syntactic analysis of the sentences is not necessary. Therefore this exercise is also suitable for patients with severe lexico-semantic disorders.

S/SEL	N/V	Object Relations	8.22 / 8.23

fertilise/fertilize **feed**

The farmer must _____ **the cows**.

The farmer must _____ the fields.

In principle, these two exercises are the inverse of the preceding ones; here, semantically similar verbs should be matched to suitable objects. The verbs must be inserted in front of the objects. In terms of difficulty and corresponding therapeutic context for which this material can be employed, these two WS mirror the preceding series, although impairment-specific variations are conceivable.

S/DIF	N/V	Object Relations	8.24

peel, **pour**, beat, grind, ...

He wants to _____ her a cup of tea.

Verbs from particular semantic fields should be inserted into sentences. The patient must therefore differentiate between semantically related verbs and also determine the characteristic meaning context for each verb in order to arrive at the correct solution. The chief target group for this exercise are pa-

tients with moderately severe word-memory disorders.

S/CON	V/N	Object Relations	8.25

The baker bakes ***a bread.***

Simple SVO sentences should be completed by the addition of a direct object. The subjects and verbs provided for the start of each sentence have been selected so that they are closely related to a particular noun (or nouns) from a particular semantic field. In terms of difficulty, this WS can be designated as a simple word-finding exercise.

S/CON	N/V	Object Relations	8.26

All the guests had to ***laugh*** at the very funny joke.

In this exercise verbs must be inserted into sentences, which are longer and structurally more complex than the simple SVO sentences with animate subjects in the preceding exercise and which are therefore more difficult to process. The lexical material in these sentences and, in particular, the VP have been selected so that a certain verb will suggest itself as a possible solution from the semantic context. Although the word-finding tasks in this WS are not so difficult, in light of the processing complexity of the stimulus sentences the exercise should only be given to patients who do not have undue difficulty with linear sentence processing.

S/CON	N/V	Object Relations	8.27

Tulips and narcissi/narcisses bloom in ***spring.***

This exercise also concerns itself with the completion of sentences, however, here abstract nouns must be inserted. The suitable noun, or the field of meaning to which the noun belongs, can be easily inferred from the lexical material in the sentences, which are of more variable construction in terms of their syntactic structure. This WS is especially suited to patients with moderately severe word-finding disorders.

S/CON	N/V	Object Relations	8.28

The housewife should ***cut*** the bread.

This word-finding exercise focuses on transitive verbs. The semantic context has been kept as neutral as possible, i.e. there are several possible options for the correct completion of the sentences. As experience shows, this increases the level of difficulty of word-finding exercises.

S/CON	V/N	Object Relations	8.29

The boy resembles ***the/his father.***

When completing these sentences, complementary terms of varying structure should be inserted in order to accord with the verb. An additional term must be inserted in all cases, as none of the verbs, strictly viewed, can be used intransitively. The selection (of the lexical material) of the complementary term is influenced to a greater or lesser extent by the individual sentence context. This exercise is especially suited to patients with moderately-severe to mild word-finding impairments.

S/CON	V/N	Object Relations	8.30

At the market, the farmer sells potatoes and ***eggs***.

These sentences contain a complex NP which require the insertion of a second noun by the patient. Depending on how the structures of stimulus sentences are analysed, it is possible in many cases to construct VP as an alternative.

S/CON	N/V	Object Relations	8.31

The chef wants to tenderise/tenderize and ***season*** the steak.

In this exercise the patient should add a second verb. The semantic content of the stimulus sentences have been constructed so that the verb provided and the verb to be inserted exhibit a close semantic relation, or they represent actions which are situationally and/or chronologically connected with each other. As in 8.30, it is also possible to insert a complete VP instead of one verb.

9 INSTRUMENTAL RELATIONS

An instrumental relation, as the term is used here, is the relation between an object and its use or function. The corresponding meaning relation between a noun and a verb can be semantically very close, in other words it belongs to the centre of the nominal concept (e.g. knife/cut), however, it can also be the result of pragmatic knowledge and belong to the periphery of the nominal concept (e.g. tweezers/to remove splinters). Six WS have been developed of which 4 focus on the relevant meaning relations at the word level and 2 at the sentence level. With regard to the processing modality, two are of type SEL, four are of type CON. The primary target group for these exercises is patients with severe to moderately - severe word-finding disorders.

W/SEL	N/V	Instrumental Relations	9.1

to cut, **to ring,** to twinkle, ..., ...

pen:
bell:
gun:

The task involves pairing 5 given verbs with 5 nouns using an instrumental relation between the words concerned. The objective of this WS is the reciprocal pairing of verb and noun concepts by means of their central semantic relation.
The exercise is suitable primarily for patients with severe word memory disorders and those who have problems processing propositional relations.

W/CON	N/V	Instrumental Relations	9.2

What can you do with the ...

knife	**cut**
brush	**paint**
...	

In this word-finding exercise the patient is required, using instrumental relations, to find suitable verbs for the nouns given. As the objects (knife, spear, broom,...) are centrally defined by the corresponding activity the exercise is relatively simple and therefore also suitable for patients with severe word-finding disorders.

W/ CON	V/N	Instrumental Relations	9.3

What can you use to ...

lock the door ***a key***

In this exercise, the patient is required to find nouns which represent the instrument in each relation. A task of this type requires a reactive naming capability and is suitable for patients with moderately severe word-finding disorders.

W/ CON	N/V	Instrumental Relations	9.4

What can you do with the following things?

dishwasher	***wash*** *(the dishes)*
lawnmower	***mow*** *(the lawn)*

In contrast to the preceding WS, in this exercise composite nouns are given. The ease of retrieval of the verbs required is not facilitated by an almost automatic connection to the noun (as in 9.2), but it is aided by the fact that the target word is a component of the composite noun.
This exercise is primarily suitable for patients with mild to moderately severe word-finding disorders, however, it is conceivable that certain patients with severe impairments could benefit provided they were able to make use of the internal structure of the composite noun given in the word-finding process, i.e. to derive the verbs from the nouns systematically.

S/ SEL	V/N	Instrumental Relations	9.5

drill, safety-pin, …, **tweezers**, …

The mother removes the splinter with the _____

A prepositional phrase at the end of each sentence should be completed by inserting a noun which expresses an instrumental relation and which is selected from a given list. The correct selection often presupposes the application of pragmatic knowledge (e.g. Guy ropes are attached to tent pegs). Many contexts from which the stimulus sentences are taken are relatively remote (e.g. 'customs in China') and the nouns which should be inserted are in some cases only infrequently used (*harpoon*); in addition, many of the nouns employed are internally complex

(*safety-pin*) and/or orthographically challenging.

The objective of this WS is to stimulate the availability of rarely used nouns by activating the central functional relation for the word concepts. The target group for this exercise is patients with moderately severe word-finding disorders. If the prompts are omitted the accent of the exercise changes to some extent in that, on the one hand the demands on the word-finding skills are increased whereas on the other hand more terms become eligible for insertion.

S/ CON	V/N	Instrumental Relations	9.6

The butcher cuts the meat with a ***knife***

The target words in this sentence completion exercise represent simple, everyday objects which are strongly defined by their instrumental application (knife, needle, scythe, ...). With the verb and the direct object the sentence context contains at least two key words which are of a strongly de-blocking character (sometimes tautological sentences occur). For these reasons, this WS is suitable for patients with severe to moderately severe word-finding disorders.

10 QUALITATIVE RELATIONS

This section focuses on that relation between a verb and an adjective/adverb in which the adjective qualifies the verb. Such relations can be very close (e.g. to bark/loud), but also remote (e.g. to grind/carefully). The present chapter contains one WS for each processing modality, although all three exercises deal with the relevant relation at the sentence level in the form of a verb-adverb sequence. This material was principally conceived for the therapy of moderately severe lexico-semantic disorders.

S/ DIF	V/A	Qualitative Relations	10.1

The optician grinds the glass very carefully. **correct** / false
The caretaker locks the door saltily. correct / **false**

This WS is a sentence evaluation task of the c/f type. The relation which should be evaluated, is that between the verb and the adverb. The structure of the sentences has been kept constant; they are simple declarative sentences of the form SVOAdv. The stimulus sentences contain statements which refer to common everyday situations and up to the critical point, viz. the adverb position, they are all semantically correct and to a greater extent prag-

matically plausible. As the critical point is located at the end of the sentence, this exercise is especially suitable for all those patients suffering from lexico-semantic disorders who have difficulties with the linear processing of longer sentences.

S/ DIF	V/A	Qualitative Relations	10.2 / 10.3

loudly **quickly**

The dog **runs** _____

The dog barks _____

The adverb positions in pairs of sentences with an identical subject should be filled with the appropriate adverb. Although in exercises of this type the correct solution to one sentence automatically provides the correct solution to the other, patients who suffer from severe receptive disorders for verbs and/or adjectives (adverbs) will not benefit from performing this exercise.

S/CON	V/A	Qualitative Relations	10.4

The neighbour's dog barks particularly ***loudly.***

In this sentence completion exercise, adjectives and adverbs, which have only a weak inductive link to the semantic context, should be inserted into the gap at the end of the stimulus sentence. This exercise was developed for patients with moderately severe to mild word-finding disorders (for adjectives/adverbs).

RELATIONS BETWEEN PROPOSITIONS

Relations between propositions assume importance wherever the boundaries of sentence semantics are exceeded and text grammar or discourse grammar commences. For heuristic reasons, we took the decision in the following WS to focus on two aspects from this field which, in our opinion, have a relevant function in the evaluation or therapy of lexico-semantic deficits.

11 QUESTION - ANSWER

The WS collected in this chapter can be grouped according to two aspects corresponding to their various objectives. The two DIF WS should primarily serve

to show whether, and to what extent, impairments are present in the processing of simple Wh-questions, while not forgetting that they also have a therapeutic value. The 6 WS of type CON serve to prepare and facilitate reactive naming skills, and we have confined ourselves here to the categories noun and adjective.
This chapter contains exercises for lexico-semantic disorders of all degrees of severity.

S/ DIF	S/S	Question-Answer	11.1 / 11.2

What do you drink coffee from?

from beans
from a glass
from a cup

For each simple Wh-question the patient is presented with three answers from which the correct one should be selected. The answers have an identical syntactic construction - each consists of a prepositional phrase which commences with the same preposition. The two unsuitable answers function systematically as semantic distractors: in one case there is a semantic relation (hyponymy) between the noun in the correct answer and the noun in the false answer (sports park/car park), otherwise the correct understanding of the verbs in the question (to park vs. to drive) is the prerequisite for selecting the correct answer.

The nature of this exercise dictates that unsuitable answers can often be disqualified for pragmatic reasons and not for genuine semantic reasons - this should be borne in mind especially when treating Wernicke aphasics.

These two WS are suitable for patients with moderately severe to mild semantic disorders.

S/ CON	S/N	Question - Answer	11.3

Who sells meat and sausages? ***The butcher***

This question and answer exercise focuses on word-finding skills involving simple concrete nouns. The lexical material in the questions contains clear semantic clues for the identification of the target word, i.e. the answers require reactive naming skills; suitable for patients with severe word-finding disorders.

S/CON	S/A	Question - Answer	11.4

What is a circle like? ***round***

This exercise is designed specifically for the therapeutic treatment of word-finding disorders which relate to adjectives. The questions given require as an answer an adjective which expresses a characteristic or an inherent quality of the noun. The answers can therefore be regarded as promoting predicative or reactive word-finding skills. The therapist is able here to vary the form of the exercise considerably by defining the type and the number of adjectives required in each individual case. For this reason, the WS is not designed for any particular degree of severity of word-finding disorder.

S/CON	S/A	Question - Answer	11.5

What is pepper like? ***hot***
What can a dog be like? ***faithful, aggressive, ...***

As the relation between the nouns given and the adjectives required in 11.5 is generally not so strongly defined as compared with exercise 11.4, the word-finding task presented here involves predicative word-finding skills to a greater extent than reactive word-finding skills. Despite the superficial similarities with 11.4, this exercise is considerably more demanding.

S/CON	S/N	Question - Answer	11.6 / 11.8

What is the room called that you sleep in? ***bedroom***

The word-finding process for inaccessible compound nouns is often facilitated by giving a (functional) description of the object in question. In the present WS compound nouns have been selected which are easy to define by means of their function. The target words have not been vetted, however, with reference to the criteria descriptiveness or internal composition. Due to their reactive character, the question-answer format in these WS reduces the level of difficulty of the word-finding process.
These WS are suitable for patients with mild to moderately severe word-finding disorders.

12 IDIOMATIC PHRASES

It often becomes apparent, particularly in mild semantic disorders, just what difficulty the patients have with non-literal meanings and how easy it is, as a result, for misunderstandings to arise in seemingly simple communication activities. This worksheet is firstly of diagnostic value; it enables a check to be made as to whether these kinds of difficulties are present.

S/DIF	S/S	Idiomatic Phrases	12.1 / 12.2

She saw the light.

The new bulb worked.
Now, something is clear to her.
She does'nt understand anything.

Each sheet contains a number of idiomatic expressions, each of which is followed by three sentences. From these three sentences, the patient should select the one which paraphrases the meaning of the idiom. The other two sentences have been systematically designed to mislead: one of them expresses the opposite meaning, the other gives a literal interpretation of the idiomatic expression. From the distribution of mistakes it is possible to determine whether the patient only has difficulty understanding the non-literal meaning precisely or whether a non-literal meaning is not taken into account at all.

This exercise can be employed for patients with mild to moderately-severe semantic disorders.

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Word- and Picture Semantic Impairments

Worksheets for Aphasia Therapy

Drawings by Michaela Bautz

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Part 2

Picture Semantic Impairments

NATVerlag

Notes to the Translation

Word and Picture Semantic Impairments is a translation into English of two volumes of a German series for aphasia therapy. For the first time, both volumes are offered together in one folder in the English version. *Word and Picture Semantic Impairments* is available in both British and American English.

The worksheets were translated in accordance with the linguistic system on which the German edition is based. Word-for-word translations were avoided wherever they were not compatible with the underlying linguistic purpose.

The two versions of the material each contain their own series of worksheets, entitled 'GB version' and 'US version'. They differ both in terms of the word and the picture material as a result of orthographic and lexical factors, differences in frequency of use, and cultural aspects.

There is one common accompanying booklet for the two versions. Differences between the British and the American version are indicated in the form 'English variation/American variation' (e.g. *motorway/highway*).

Contents

INTRODUCTORY COMMENTS

Part 2 of this volume, *Picture Semantic Impairments*, is a collection of materials for the treatment of semantic impairments which occur within the context of visual object or picture processing, i.e. in the differentiation of visually perceived objects or images according to semantic criteria (assignment to a semantic field etc.) or in the naming of objects either orally or in written form. *Picture Semantic Impairments* consists of 254 worksheets, containing approx. 500 pictures and an accompanying handbook (part 2 of the handbook), which explains the theoretical and therapeutic concepts behind the material and contains a detailed description of the material itself and offers some guidance for its application.

As in Part 1 of this volume, *Word Semantic Impairments*, the therapy material in *Picture Semantic Impairments* can be processed directly, i.e. it is not simply a collection of pictures, but a series of worksheets which in each case contains a particular order of one or more pictures - selected according to linguistic and therapeutic criteria - in combination with written word stimuli.

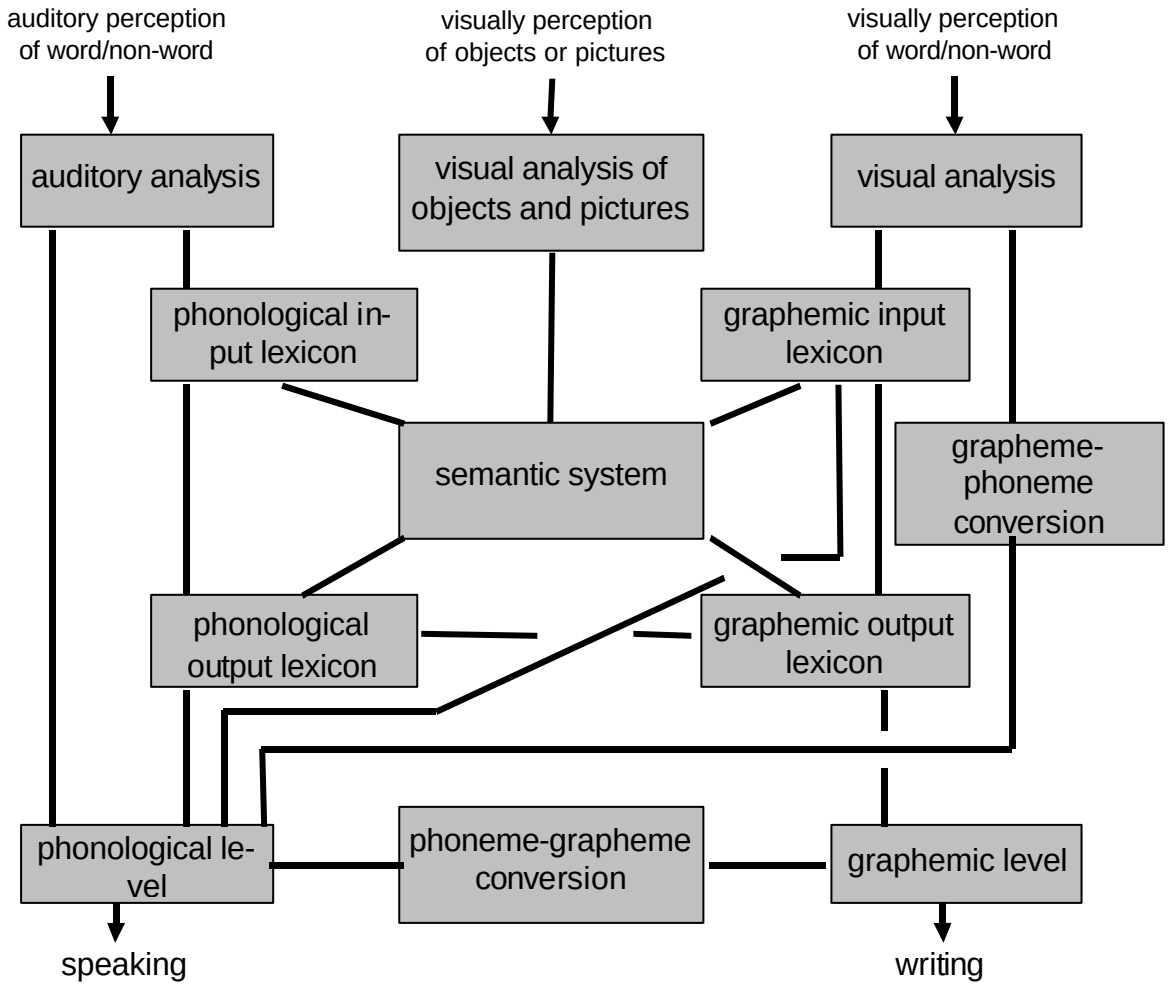
Cerebral disorders of semantic processing in the context of visually perceived objects or pictures can occur either in combination with impairments of the semantic processing of words (semantic paraphasias), or independently of word-semantic disorders. The material in this volume focuses specifically on semantic disorders in the context of picture processing and is, therefore, conceived as an independent, disorder-specific volume. Naturally, this does not mean that the picture-semantic therapy material can not be implemented to support the therapy of word-semantic disorders.

Semantic disorders within the context of the visual processing of objects and pictures can occur in all aphasic syndromes and in all degrees of aphasic impairment severity. In some cases, the impairment of picture-semantic processing can be a part of the whole symptom profile; however, it can also occur selectively and be specific to a certain modality while other aspects of language processing remain intact. For these reasons, the individual disorder profile provides the basis for deciding to what extent, in which therapeutic context, and with which objectives the materials presented here are to be employed. Their use is always indicated if impairments have been determined in the processing of pictures or visually perceived objects according to semantic criteria.

PICTURE SEMANTIC IMPAIRMENTS

Lexico-semantic disorders which occur in the context of the processing of pictures, for example in the sorting of pictures into semantic categories (hyponymy, part-of relation etc.), in tasks which require the sorting of pictures and words according to semantic categories, in the written or oral naming of pictures etc., can occur in a specific modality and affect only the lexico-semantic processing in relation to the processing of pictures without affecting the semantic processing of words; they can also occur parallel to disorders in the word semantic area. The terminological differentiation between picture- and word-semantic disorders reflects the fact that a modality-specific delineation is possible between lexico-semantic disorders which relate either to words or to pictures.

The logogen model, a functional model of the cross-modal lexical processing of words (auditory recognition, reading aloud, writing to dictation, oral or written naming of pictures etc.), makes it possible to localise the picture semantic processes in language processing, to separate them from word semantic processes, and to explain how picture and word semantic processes can interact:[1]



Cerebral disorders affecting the processing of individual words may be modality specific and can, for example, selectively affect the phonological or the graphemic processing of words in language perception or in language production. The logogen model takes account of this by means of a systematic differentiation between the functions of language perception and language production, on the one hand, and the functions of the phonological and graphemic processing of words, on the other.

The auditory recognition of words addresses phonological word forms in the phonological input lexicon; the graphemic recognition of words addresses graphemic word forms in the graphemic input lexicon. As a means of checking these functions, words and so-called legal neologisms (words which are phonologically or graphemically possible but which, in fact, do not exist) can be presented either in auditory (spoken) or in written form, and the patient is required to decide which elements are admissible (existing words). In aphasic patients, both modalities of the processing of individual words can be impaired or remain intact independently of each other.

The auditory and graphemic recognition of words is functionally independent of oral and graphemic word production, which is based on the activation of phonological word forms in the phonological output lexicon or graphemic word forms in the graphemic output lexicon. Examples of modalities of oral or graphemic word production include spontaneous utterances and spontaneous writing of single words[2]; in combination with auditory or graphemic recognition of words, examples are writing to dictation and reading aloud; and in relation to the processing of pictures, oral or written naming.

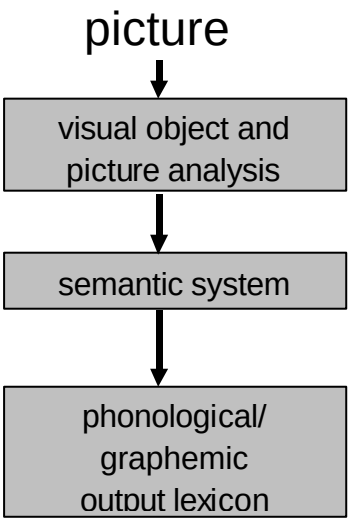
We must differentiate between the phonological and graphemic processing of words in language perception and language production, and the processing of the word meaning, which is the basis for the retrieval of information in the semantic system, for example information concerning semantic fields (furniture, fruit, clothing etc.). Words can be processed via their meaning, but the phonological or graphemic processing of words is also possible without meaning, for example when reading via the direct lexical route *graphemic input lexicon ® phonological output lexicon* (reading without imputing meaning), or when making meaningless utterances in spontaneous speech. If words are processed according to their meanings, then the requirements of the corresponding form of language processing determine with which lexicons the semantic system works:

- PHONOLOGICAL INPUT LEXICON →SEMANTIC SYSTEM: auditory comprehension of words
- GRAPHEMIC INPUT LEXICON →SEMANTIC SYSTEM: comprehension of words when read
- SEMANTIC SYSTEM → PHONOLOGICAL OUTPUT LEXICON spontaneous speech, reading aloud, oral naming
- SEMANTIC SYSTEM → GRAPHEMIC OUTPUT LEXICON spontaneous writing, writing to dictation, written naming

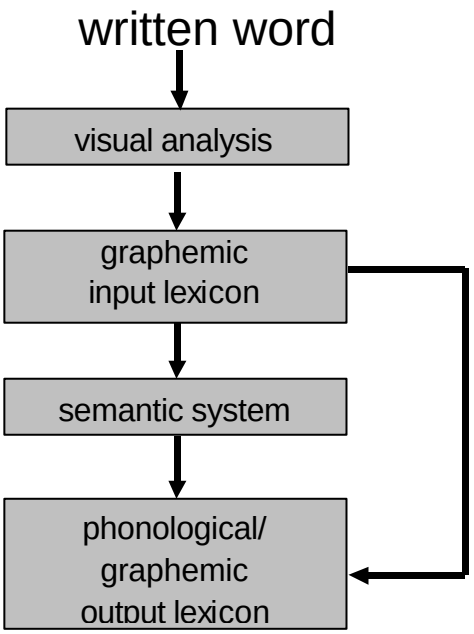
The visual analysis of objects and pictures in the version of the logogen model employed here represents an interface between the processing of indi-

vidual words and the functions of visual perception which are active during the visual processing of objects or pictures. The visual analysis of objects and pictures associates perceived objects or pictures with structural descriptions or patterns which indicate central aspects of the visual form of objects from a canonical perspective (Humphreys et al. 1988). During picture processing, the visual analysis of objects and pictures abstracts the material characteristics of the pictures, i.e. the differences between a line drawing, a shaded pencil-drawing and a coloured drawing, and as such represents for picture processing a system which is similar to the visual word analysis in the area of graphemic word processing, which analyses letters in relation to abstract letter forms which are independent of specific scripts or typefaces (for example handwritten versus type-written letters). The processing of lexico-semantic information with pictures is based on the fact that representations, which are derived from abstract visual forms, are addressed in the semantic system - a process which is functionally independent of the visual lexico-semantic processing of words:

Picture semantic processing



Word semantic processing



Picture- or word-semantic impairments can have various causes:

- They may be located pre-semantically, i.e. they could affect the visual analysis of objects and pictures and/or the visual analysis of words/non-words, or the graphemic input lexicon and/or access from these systems to the semantic system, without the semantic system itself being impaired. In this case, the productive lexico-semantic processes which do not depend on picture- or word-semantic processing in language perception, such as the spontaneous utterance of individual words, should remain relatively un-

affected.

- Alternatively, where the pre-semantic analysis is intact, impairments of the semantic processing of pictures or words can affect the semantic system itself, which should lead to impairments in both language perception and language production.
- Thirdly, picture or word semantic impairments can be located post-semantically, i.e. an impairment of the semantic system access to the phonological or graphemic output lexicon. In this case, language production will be affected and language perception will remain relatively unaffected.

Within the context of the logogen model applied here, only in the case of pre-semantic impairments do we expect modality-specific differences between the semantic processing of pictures and words, as only the pre-semantic systems are modality-specific for either word or picture processing.

A specific test to determine whether a patient suffers from an impairment in pre-semantic picture analysis can be carried out with picture material which contrasts visually similar pictures. Patients whose impairments centre on the visual analysis of objects and pictures are conspicuous in that they have difficulties in differentiating between pictures which are visually similar (for example a nail and a ball-point pen) rather than those which are semantically similar (for example an apple and a banana). Pre-semantic impairments of picture semantic processing may, however, also be located in the access of the visual analysis of objects and pictures to the semantic system, without the visual analysis of objects and pictures itself being impaired. In this case, differentiation between visually similar pictures should be possible, without being based on reference to semantic information.

In contrast to the version of the logogen model applied here, it is also possible for the semantic system itself to be factorised into a word-specific and picture-specific system such that, also in the case of impairments in the semantic system, one would expect modality-specific differences between the processing of lexico-semantic relations with pictures and with words (Job & Sartori, 1988). Such a modality-specific split of the semantic system into a word-semantic and a picture-semantic system is supported by the fact that performance dissociation can occur in word and picture processing which can not be attributed to either pre-semantic impairments in the area of the visual analysis of objects and pictures or the graphemic input lexicon (Shallice, 1987). Possible evidence for the existence of modality-specific semantic systems can be derived, for example, from the existence of modality-specific naming impairments, i.e. naming impairments which occur only in one mode of perception, for example the visual perception of objects, whereas naming skills in other modes of perception, for example the auditory perception of sounds, remain intact. Patients who suffer from modality-specific naming impairments in the area of the visual processing of objects can not put a name to a picture of a bell, whereas the sound of a bell will be immediately associated with the word *bell*. It is interesting to note that in the modality in which naming was not possible, for example in the visual modality, such patients may be able to demonstrate by gesture the nature of the stimulus object (the movement of a bell, pointing to the ear etc.). In such cases, the visual-semantic processing impairment cannot be located in the area of the visual analysis of objects and pictures (the ob-

ject was visually processed); this could, however be explained by a post-semantic disconnection impairment between modality-specific picture/object semantic processing and the phonological output lexicon.

On the other hand, data of this kind do not necessarily imply a modality-specific split in the semantic system. Even if we assume a unified semantic system, modality-specific differences in the lexico-semantic processing can be explained by adopting certain assumptions concerning its internal structure (Caramazza et al., 1990). If the information related to a term is structurally represented in the semantic system, i.e. as predicate fields with visual, acoustic or functional properties etc., then also in a unified semantic system one would expect modality-specific effects in patients with cerebral disorders.

IMPAIRMENTS IN THE SEMANTIC SYSTEM

Lexico-semantic impairments in connection with an oral/written reaction to pictures can be the result of damage to the semantic system itself. In line with modern neurolinguistic research, we hold the view that there are certain highly specialised structures and processes in the brain which are solely responsible for the representation of semantic knowledge and the calculation of semantic relationships. Equally, the semantic system, in common with all other language knowledge systems, is a result of language acquisition, which we consider a part of the cerebral maturity process. Accordingly, damage to the neural substance of the brain may also lead to specific functional defects within the semantic system, which manifest themselves as semantic paraphasias.

The logogen model, outlined above, implies that there are basically two causes of semantic errors, viz. impairment in the access to a system of semantic knowledge which is itself intact, and deficits within the semantic representation itself or structural disintegration within the semantic lexicon.

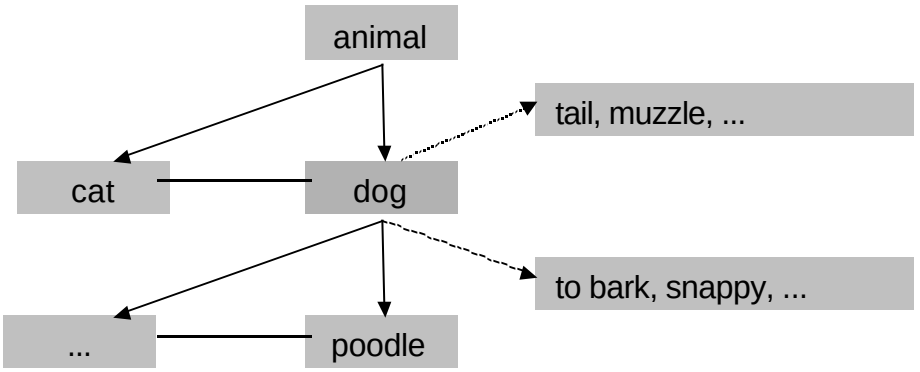
The semantic lexicon contains information about the meanings of words in a language, and its internal organisation is such that the diverse semantic relations which exist between linguistic concepts can be read or calculated from its structure. Concepts which are particularly closely related to one another form semantic fields. Within such subsystems, there are particularly close and varied semantic connections between individual concepts, some of which are prototypical elements, and others, less typical elements of the field (for example a finch is a prototypical bird, a parrot is not).

Semantic relationships, which can be derived from the internal structure of the semantic lexicon, can be divided into two basic types: classificatorial and non-classificatorial meaning relationships. Classificatorial meaning relationships are: superordinate and subordinate concepts (furniture - table), hyponymy (table - chair), and part-of relation (armrest - chair). These hierarchical relationships form the organisational framework of the semantic lexicon and define the extent of the semantic fields. Meaning relationships which are not classificatorial include, inter alia: situational-referential relationships (table - living room), associative relationships

(table - breakfast) and pragmatic relationships (table - joiner).

Each individual concept is composed of central and peripheral semantic features. The centre or core of a concept consists of the sum of all classificatorial information (animal - dog - poodle; dog - cat; dog - muzzle) as well as meaning characteristics which exhibit a high degree of inter-subjective agreement within the speech community (dog - to bark; dog - aggressive). The concept periphery, on the other hand, consists of more idiosyncratic or accidental aspects of meaning associated with a term (dog - large; dog - snappy). There is no clear division between the central and the peripheral semantic characteristics of a concept; it is rather that a continuum exists between the two with an increasing, inter-subjective variance when moving from the centre to the periphery of the concept. Concepts of similar meaning naturally share many semantic characteristics; however, it is possible that one aspect of meaning may be more central in certain cases than in others. The rank/importance which one piece of semantic information is accorded within the continuum is derived from its relevance to the word meaning, i.e. the more central it is, the greater its definitional value.

Certain information concerning the meaning of the word *dog* can be derived from the following representation:



CRITERIA USED IN PICTURE CONSTUCTION

The following criteria formed the basis for the selection of the concepts which were transformed into pictures for this volume:

CLARITY OF VISUAL REPRESENTATION

In principle, only those concepts for which a clear visual representation could be made were included, i.e. concepts which can be named by concrete nouns. Abstract concepts and relational concepts of actions and properties cannot be easily represented in picture form and are, therefore, not included in this collection of materials. Concepts such as water, grass, money were also not included, as it is not possible to provide a direct visual representation which is not terminologically ambiguous. We have deviated from this rule in only few cases (for example WS 7-41). Concepts which can be allocated to more than one perceptual or semantic category (for example knife, which is equally prototypical for the categories cutlery and weapon) were visually represented in such a way as to make possible a clear categorical allocation.

FREQUENCY

In principle, only those concepts for which a high degree of intersubjectivity could be assumed were included. Most of the concepts employed belong to categories which, in the meantime, have undergone extensive empirical examination. Examples of such frequently occurring categories, which can be considered psychologically real, are: mammals, birds, insects, crockery, cutlery, furniture, parts of the body, fruit, vegetables, tools, clothing, musical instruments, vehicles and toys. Each of these categories contains terms which are prototypical to a greater or lesser extent (for example the finch is more prototypical of the category bird than the owl). Correspondingly, concepts which are to a varying degree prototypical were selected for the picture material.

In order to be able to increase the level of difficulty and to encourage the processing of less frequently used or more complex words, concepts or semantic fields were included for which there is not such a high degree of intersubjective agreement.

The fact that there are pictures which allow for the attribution of several synonyms (for example turnip, swede) or regional/dialect terms (for example horse, cuddy) (see Snodgrass/ Vanderwart 1980) was not taken into account.

BASIC CRITERIA

The concepts are visually represented at the basic conceptual level (Rosch et al., 1976). Within a semantic system which is organised according to hierarchical-classificatorial principles, such basic conceptual levels occupy the medial position (for example animal - fish - trout). Rosch et al. (1976) suspect that these fundamental concepts are acquired earlier in the language acquisition process than others and appear to be more stable, even under aphasic conditions, i.e. in comparison to other concepts, they are less frequently or less severely affected by the disorder. In principle, it is true that most attributes are connected to such basic concepts and that, for example, in the naming of visually perceived stimuli, the

corresponding nouns are used to refer to either superordinate or subordinate categories with significant frequency.

Accordingly, in the picture material presented here, instead of placing a picture of a dachshund next to that of a cat and a hare, a visual representation of a dog will be used which is as neutral as possible, i.e. non-specific in terms of breed. In the naming of a picture within the context of other pictures, the degree of specificity of the chosen word depends on the context (within the context of dog and house, sandals would be correctly named by taking the word shoe; within the context of boots and pumps, this would not be the case, Leuninger et al., 1987). In order to encourage higher degrees of specificity, we have included a set of semantic fields in which the basic concept functions as the superordinate concept (Chapter 7, WS 44 - 48).

CRITERIA FOR PICTURES

The visual representation of the concepts is in the form of black line drawings on a white background. In order that the pictures be as typical, clear, and realistic as possible, we have oriented ourselves on the criteria upon which Snodgrass/Vanderwart 1980 based their standardised picture material (cf p. 181):

- the drawings must be realistic, i.e., details must also be represented correctly;
- each picture should be as typical a representation of the concept as possible;
- in order to avoid ambiguity of the image, the concept must be clearly visualised;
- the picture must be so realistic that it conforms to the actual complexity of the real-life object, i.e. it should not abstract from the relevant details.

In terms of the angle of view, care was taken to ensure the adoption of a natural perspective which corresponds to the likely perspective of the visual form which is activated in the visual analysis of objects and pictures. In the visual representation of animals and many other objects, this is assumed to be the side view; for other objects, such as pieces of clothing, the frontal view would correspond to the natural perspective. In addition, within the individual semantic categories, care was taken to ensure that differences in size between the elements were not too severely diminished.

STRUCTURE AND APPLICATION OF THE MATERIAL

The collection of materials described here consists of a total of 254 worksheets on 127 double-sided photocopyable sheets, containing approx. 500 pictures. The nine chapters deal with aspects of picture semantic processing which are often affected by disorders in this area:

1-2 Hyponymy 1 and 2
Word-picture matching exercise in an arrangement of five pictures: one picture which corresponds to the target term (bread), a hyponym to the target term (roll), a distractor from a related semantic field (sausage), a situational distractor (knife), and an unrelated distractor (sheep).

3 Part-of relation 1
Word-picture allocation in an arrangement of five pictures: a target picture, which represents a concrete object (bush), a distractor which represents a part of the target object (branch), a distractor which represents a part of a hyponym (trunk), a situational distractor (nest), an unrelated distractor (ear).

4 Part-of relation 2
Word-picture matching exercise in an arrangement of five pictures - the inverse of section 3: a target picture which shows part of a concrete object (trousers/pants), a distractor which shows the whole corresponding object (suit), a hyponym as distractor (costume), a situational distractor (wardrobe), and an unrelated distractor (apple).

5 Part-of relation, semantic similarity
Word-picture matching exercises, each consisting of two pictures which show similar parts of similar objects (candle/wick, lamp/light-bulb).

6 Part-of relation, concept
Word-picture matching exercise with pictures in which conceptually important parts are emphasised (tree: trunk, branch, root, leaf).

7 Semantic fields
Word-picture matching exercise with six pictures from a semantic field (shirt, jacket, pullover/sweater, trousers/pants, dress, skirt).

8 Situational relations
Word-picture matching exercise consisting of two pictures in which a situational-referential relationship exists between the objects (wardrobe, skirt).

9 Homophones
Word-picture matching exercise in an arrangement of five pictures: the target picture (file: office item, tool), a distractor which is either semantically or situationally closely related to a homophone of the target word (hammer), a distractor which is closely related either situationally or semantically to the target word (hole punch), a distractor which is closely related to the homophone (pliers), an unrelated distractor (strawberry).

In principle, any part of the picture material presented here can be used as a starting point for therapy. However, the first two chapters are particularly suitable as an introduction, in order to be able to check the nature and degree of severity of the patient's impairments. Chapters 3 and 4 contain pictures of parts of objects which, as experience has shown, are more difficult to interpret than pictures of complete objects and, as such, may be less suitable as an introduction. In Chapter 5, although only two pictures or words are involved per task, the semantic differentiation skills required make these worksheets difficult in another respect. Chapter 8 may be a particularly appropriate starting point for patients with severe impairments, as no classificatorial relations need be calculated.

Except for Chapter 7, there is no internal order for the worksheets in the individual chapters, for example according to the level of difficulty. For ease of use, Chapter 7 is so arranged that central, simple word fields appear at the beginning and more difficult word fields are towards the end; as far as possible, neighbouring semantic fields follow on from each other.

PROCESSING MODALITIES

The worksheets can be used in all modalities of picture-semantic processing. The following are possible:

- a receptive application with written word stimulus: showing the picture after the word has been silently read by the patient
- a receptive application with written and parallel auditory stimulus, or with only auditory word stimulus: showing the picture after the stimulus word has been read silently by the patient while at the same time the therapist reads the stimulus aloud, or the word is covered and is only read aloud
- an oral or written productive application: oral or written naming of the target picture or pictures
- a categorisation application: sorting the pictures according to semantic criteria

Depending on the modality, different functions in the processing of individual words are addressed.

As well as the modes of application already described, there are other alternative methods of processing by means of which the individual disorder profile and the specific demands placed on the therapeutic setting can be addressed and possible accompanying disorders dealt with. For example, words may be cut out and individually matched. In this way it is possible to circumvent problems which result from the patient having to write. In particular in Chapters 6 and 7, the processing requirements, which depend on the nature of the task involved, can be made less demanding by cutting out the word stimuli and employing only those which are either particularly prominent or simple. Possible difficulties in the successive matching of words to the pictures and interference between the word and picture stimuli can also be avoided by presenting the individual (cut-out) words or pictures consecutively.

Another way of applying the therapeutic materials in this volume is to match the picture and word stimuli, which are presented simultaneously on the worksheets, one after the other. For example, the word stimulus can be presented in either spoken or written form before the picture is shown in order to make the naming task easier via a prior activation of the semantic system.

Additional alternative methods of application are included in the following section: Description of the Material.

EVALUATION AND CORRECTION OF MISTAKES

In general, in aphasia therapy, the patient's linguistic errors should only be corrected and commented on when it can be shown that he/she will benefit as a result. Patients with severe receptive impairments, insufficient monitoring or impaired mechanisms of linguistic self-correction do not, as a rule, benefit from explicit correction. Equally, as in all other aspects of language processing, picture semantic processing is not effected consciously. The visual perception of a pictured object automatically leads to the activation of the corresponding semantic concept, a process which can not be consciously influenced; and this is also true in the case of the semantic processing of a word which is read or heard. As these are unconscious processes in unimpaired language processing, a therapy for impaired functions in picture semantic processing can not consist of requiring the patient to learn anew the semantic relations and their connections necessary to process words and pictures.

The aim of therapy is rather to achieve an unconscious, if initially temporary, but ideally stable synchronisation of the functions involved in language processing, which, despite neural damage, are still present but which no longer communicate. For these reasons, the explicit correction of mistakes does not occupy a central position in the treatment. Nevertheless, linguistic error analysis is valuable in the individual diagnosis and provides important information concerning the current disorder profile and its consequences for therapy. In principle, this also applies to incorrect processing within the context of this material.

EVALUATION OF THE MATERIAL

The material in this volume has been tested under clinical conditions to ensure that it conforms to the most important criteria concerning the construction of the pictures - realistic detail, typical and clear representation of the corresponding concept, and the correct representation of detail. The drawings were tested on a large number of aphasic patients, suffering from various syndromes and with various degrees of severity, in order to check their suitability for picture semantic processing; furthermore, random tests were made with non-impaired speakers of various ages. During the development phase of the material, whenever a picture was not clearly recognized or regarded as non-typical, an improved drawing was substituted. An initial, clinically oriented test of the ease-of-use and the therapeutic effectiveness of the worksheets confirmed that the materials, as presented here, are suitable for the treatment of picture semantic disorders.

DESCRIPTION OF THE MATERIAL

1 HYPONYMY 1

WS	Word	Pictures
1	apple	apple, pear, carrot, apple tree, radio
2	table	table, chair, oven, cup, bird
3	dog	dog, cat, fish, bone, book
4	hammer	hammer, pliers, scissors, nail, cherry
5	knife	knife, fork, cup, salami, tree
6	radio	radio, television, vacuum cleaner, singer, pig
7	leek	leek, tomato, banana, bowl, antlers
8	teapot	teapot, cup, fork, cake, sandal
9	tulip	tulip, daffodil, bush, vase, handlebars
10	dress	dress, skirt, shoe, wardrobe, glass
11	bread	bread, roll, salami, knife, sheep
12	comb	comb, brush, nail-file/nail file, mirror, wood/forest
13	hand	hand, foot, heart, ring, fish
14	oven	oven, fridge/refrigerator, grill, frying-pan, tulip
15	book	book, newspaper, picture, bookcase, leek
16	ring	ring, bracelet, belt, evening-dress, plane

17	tiger	tiger, lion, cat, circus tent, champagne glass
18	ball	ball, tennis racket, saxophone, referee, nest
19	fountain pen/pencil	fountain pen/pencil, ball-point pen, paint-brush, letter, motorbike/motorcycle
20	house	house, church, tent, fence, tiger
21	violin	violin, trumpet, football/soccer ball, conductor, brush
22	hair drier/ hair dryer	hair drier/hair dryer, electric razor, mirror, vacuum cleaner, grapes
23	aeroplane/ airplane	aeroplane/airplane, helicopter, rowing boat/row boat, pilot, cow
24	suitcase	suitcase, travel-bag, bucket, car, hen
25	broom	broom, mop, vacuum cleaner, dustbin/carbage can, glasses
26	lake	lake, stream, wood/forest, rowing boat/row boat, wardrobe
27	moon	moon, sun, satellite, calendar, paint-brush
28	spade	spade, rake, broom, fence, ring
29	plaster/ crutch	plaster, bandage, crutch, doctor, evening-dress/ crutch, wheel chair, bandage, doctor, evening-dress
30	bridge	bridge, tunnel, tower, railway/railroad, vase

This chapter consists of 30 worksheets each containing five pictures, one of which represents the target word, while the other four are systematic distractors. The target words are simple nouns (basic concepts, e.g. *apple, house, suitcase*) from 30 basic, everyday semantic fields. For each of these semantic fields, concepts were chosen which were as prototypical as possible and whose central position within the semantic field is established. We assume that the stability of these prototypical basic concepts, which are used with a high degree of frequency and acquired at an early age, must form the basis for the reorganisation of an impaired access to the semantic system. Conversely, the extent of impairment is indicated by the number of mistakes which patients make in comprehending or using nouns of the type described. The selection of distractors takes account of the systematic nature of aphasic performance errors in naming, which demonstrates that the use of neighbouring hyponyms of the target word are among the most frequent errors. In the selection of the word fields in this chapter we have, therefore, made sure that for each important characteristic (prototypicality, frequency, clarity of visual representation or visual distinctiveness) two equally prominent hyponyms have been chosen which can serve either as target word or hyponymic distractor (*apple/pear, house/church, suitcase/travel-bag*). A hyponym from a neighbouring semantic field has been selected as an additional distractor (*apple/carrot, house/tent, suitcase/bucket*), in order to cover another frequent type of classificatorial error. The third distractor in each worksheet is not of the classificatorial type, but forms a situational or pragmatic relation with the target word (*apple/apple tree, house/fence, suitcase/car*). Frequent errors of this type indicate a high degree of instability in classificatorial relations. The last distractor on each worksheet has no relation whatsoever to the target word (*apple/radio, house/tiger, suitcase/hen*) and no relation to any of the other distractors.

Our aim has been to achieve a uniform level of difficulty throughout the 30 worksheets, as minimal differences in terms of the variables, such as frequency of use, prototypicality, degree of similarity between the target word and hyponym, clarity of visual representation etc., can lead to differences in the ease of retrieval of the target word. Accordingly, items such as *apple/pear*, *knife/fork* are certainly more closely related than *tulip/daffodil*, *violin/trumpet*;

the word field fruit is, in general, more common than the word field bodies of water; *fountain pen/pencil* and *ball point pen* are certainly more difficult to differentiate visually than *ball* and *tennis racket* etc. The worksheets presented here are aimed initially at testing the understanding of words and indicating a therapy therefor. The term for the target picture is therefore printed on each sheet. As such, the worksheets can be employed equally well for the modalities graphemic word comprehension, and auditory word comprehension (by uncovering / cutting out the words) and for word comprehension using both auditory and written stimuli. There is nothing to prevent their use for the naming of pictures within the context of systematic distractors, if the printed words are removed.

2 HYPONYMY 2

WS	Word	Picture
1	pliers	pliers, hammer, scissors, nail, cherry
2	television	television, radio, vacuum cleaner, singer, pig
3	bandage/ wheel chair	bandage, plaster, crutch, doctor, evening dress/ wheel chair, crutch, bandage, doctor, evening dress
4	lion	lion, tiger, cat, circus tent, champagne-glass
5	rake	rake, spade, mop, fence, ring
6	skirt	skirt, dress, shoe, wardrobe, glass
7	tunnel	tunnel, bridge, tower, railway/railroad, vase
8	bag	travel-bag, suitcase, bucket, car, hen
9	helicopter	helicopter, aeroplane/airplane, rowing-boat/row boat, policeman, cow
10	sun	sun, moon, satellite, calendar, paint-brush
11	roll	roll, loaf, salami, knife, sheep
12	newspaper	newspaper, book, picture, glasses, leek
13	daffodil	daffodil, tulip, bush, vase, motorbike-handlebars/motorcycle handlebars
14	armband/bracelet	armband/bracelet, ring, belt, evening-dress, plane
15	chair	chair, table, oven, cushion, bird
16	tomato	tomato, leek, banana, salad bowl, antlers
17	foot	foot, hand, heart, shoe, fish
18	fork	fork, knife, cup, meal, tree
19	pear	pear, apple, carrot, pear tree, radio
20	cup	cup, teapot, fork, cake, sandal
21	brush	brush, comb, nailfile/nail file, mirror, wood/forest
22	tennis racket	tennis racket, ball, saxophone, tennis court, nest
23	stream	stream, lake, wood/forest, fishing-rod, wardrobe
24	trumpet	trumpet, violin, ball, band, brush
25	cat	cat, dog, fish, mouse, book
26	ball-point pen	ball-point pen, fountain pen/pencil, paint-brush, letter, motorbike/motorcycle
27	church	church, house, skyscraper, candle, tiger
28	mop	mop, broom, vacuum cleaner, bucket, glasses
29	refrigerator	refrigerator, oven, shelves, milk-bottle/milk bottle, tulip
30	electric razor	electric razor, hair dryer, vacuum cleaner, mirror, grapes

In the previous chapter, two equally prominent hyponyms from each of 30 word fields were included, one of which was the target word and the other, the first distractor. In this chapter, the order has been reversed such that the hyponymic distractor from the first chapter has become the target word, and the target words from the first chapter now function as hyponymic distractors. The remaining distractors have been retained wherever possible or minimally altered (instead of *apple/apple tree* we now have *pear/pear tree*, while *carrot* and *radio* remain as distractors for both target words). The positioning of the 5 pictures on each worksheet has been changed, and the order of the worksheets has been randomised in order to reduce the influence of familiarity with the material.

All of the material descriptions and guidelines for the use of the materials in the previous chapter are equally applicable here.

3 PART-OF RELATION 1

WS	Word	Pictures
1	bush	bush, branch, trunk/log, nest, ear
2	leg	leg, foot, hand, trousers/pants, sun
3	car	car, steering-wheel, handlebars, petrol station/gas station, glass
4	cup	cup, handle, lid, cake, motorbike/motorcycle
5	stag/buck	stag/buck, antlers, horns, wood/forest, book
6	church	church, altar, stage, priest, pliers
7	saw	saw, saw-blade/saw blade, drill-bit/drill bit, log, cake
8	knife	knife, blade, handle, salami, rowing boat/row boat
9	motor-way/highway	motorway/highway, crash barrier/guard rail, signal, car, wardrobe
10	factory	factory, chimney, church tower, fork-lift truck, lion
11	boat	rowing boat/row boat, paddle/oar, sail, lake, vacuum cleaner
12	piano	piano, keyboard, violin neck, conductor, vulture
13	fountain pen/ radio	fountain pen/radio, nib/antenna, cartridge/mouse, letter/singer, toothpaste
14	suit	suit, trousers/pants, skirt, wardrobe, apple
15	bottle	wine-bottle, cork, lid, grapes, sandal
16	horse	horse, hoof, dog's paw, saddle, calendar
17	aeroplane/ airplane	aeroplane/airplane, wing, propellers, pilot, fish
18	telephone	telephone, receiver, loudspeaker/speaker, secretary, tomato

In addition to the use of a hyponym instead of the target word, classificatorial naming errors also include the naming of a superordinate concept and errors in the part-of relation. As superordinate concepts can not be visually represented, it is not possible to treat this important category errors adequately in this volume; treatment of this area requires a more intensive approach with purely speech-based material. For this reason, more emphasis has been given to hyponymy (Chapters 1, 2 and 7) and part-of relation (Chapters 3 to 6).

In the present chapter (and in Chapter 4) the same setting has been used as in the two previous chapters; five pictures are presented, of which one represents the target word and the others are systematically determined distractors. Chapters 3 and 4 each comprise 20 worksheets. The target words in Chapter 3 are simple basic concepts,

some of which were employed in previous chapters (approximately one-third). The remaining target words essentially comply with the criteria which have already been mentioned: simplicity, frequency of use and clarity of visual representation. As here additional criteria, such as availability, clarity of representation and familiarity with a typical 'part' of the 'whole', were the most important factors governing the selection of items, Chapter 3 contains more target items which are less prototypical for their semantic field (cf. *skirt* and *dress* in 'Hyponymy' with *suit* and *costume* in 'Part-of Relation' etc.).

Semantic paraphasias follow the systematic nature of the part-of relation in both directions: thus, performance errors are made in which the whole is named in place of the part and, equally, there are those in which the complete object is replaced by a typical part. It was, accordingly, of value to make use of the chosen basic concepts from both directions: in Chapter 3 the basic concept itself represents the target word and one of its parts forms the first distractor; in Chapter 4 this pattern is reversed.

The 20 worksheets in Chapter 3 deal with the part-of relation by introducing a picture of the target word (*cup, stag/buck, boat*) in combination with the picture of a typical part of the object in question (*handle, antlers, paddle*). A comparable part of a similar object serves as distractor, e.g. the *lid* for *handle/cup*, the *horns* for *antlers/stag(buck)*, and *sail* for *paddle/rowing boat*. A further distractor is situatively related, e.g. *cake* for *cup*, *wood* for *stag/buck*, or *lake* for *boat*. The remaining distractor exhibits no relation to the target word or to any other of the pictures on the worksheet.

The part-of relation does not have the same status for all of the items included in this chapter: sometimes it is relevant for the concept of the corresponding whole (*blade/saw*, *keyboard/piano*), sometimes the relation is looser (*chimney/factory*, *cork/bottle*). Some concepts relate to objects which, by definition, consist of various parts, each of which represents a conceptual and, therefore, also a visual entity (*suit/trousers(pants)*, *rowing boat/paddle*, *church/altar*, *leg/foot*). In this volume, the concepts chosen have the advantage that the corresponding parts are more suitable for visual representation.

In those cases where the individual parts are not easily recognisable as part of the whole, the danger exists that the patient will disregard the corresponding picture in the processing of the worksheet. This is a possibility which can not be completely excluded, but it may be countered by the reversed order of target word (part) and distractor (whole) in Chapter 4.

In terms of the intended processing modalities for these worksheets, the information pertaining to Chapter 3 is, in essence, also valid here: the WS are suitable for checking the graphemic, auditory and combined comprehension of words in the presence of specific distractors (part-of relation). Furthermore, they can be employed in several variations if the written target is removed or is presented separately: word-picture allocation, allocation of part to the whole by means of pointing/matching, naming in the presence of specific distractors etc.

4 PART-OF RELATION 2

WS	Word	Pictures
1	saw blade	saw blade, saw, file, log, cake
2	wing	wing, aeroplane/airplane, helicopter, clouds, fish
3	foot	foot, leg, arm, shoe, sun
4	crash barrier/ guard rail	crash barrier/guard rail, motorway/highway, rails, warning triangle, wardrobe
5	cork	cork, bottle, vase, corkscrew, sandal
6	altar	altar, church, school, priest, pliers
7	chimney	chimney, factory, church, chimney-sweep, lion
8	handle	handle, cup, sugar bowl, hand, motorbike/motorcycle
9	keys	keyboard, piano, violin, hand, vulture
10	trunk	trunk/log, tree, bush, saw, ear
11	trousers/pants	trousers/pants, suit, costume, wardrobe, apple
12	steering wheel	steering wheel, car, motorbike/motorcycle, street, glass
13	hoof	hoof, horse, dog, horseshoe, calendar
14	paddle/oar	paddle/oar, rowing boat/row boat, steamboat, lake, vacuum cleaner
15	knife blade	knife-blade, knife, spoon, salami, rowing boat/row boat
16	nib/mouse	nib/mouse, fountain pen/computer, crayon/calculator, ink/letter, toothpaste
17	antlers	antlers, stag/buck, bull, rucksack/knapsack, book
18	receiver	receiver, telephone, radio, ear, tomato

As pointed out in the material description in the previous chapter, the structure of the target item in Chapter 4 differs substantially from that in Chapter 3 (although, primarily, it involves only the reversal of the roles of the target item and distractor) and also from those in previous chapters. Apart from a few basic words (*foot*), these worksheets concern themselves with specific terms and terms which are not so frequently used (*hoof, paddle*), terms with a higher degree of abstraction (*handle, key, wing*), composite terms (*steering wheel, saw blade*), or ambiguous nouns (*receiver, trunk*). All these characteristics naturally increase the level of difficulty of the worksheets in Chapter 4 in comparison to those in Chapter 3. In addition, the visual explicitness of and familiarity with such pictures is, by their nature, lower, so that a failure to recognise or a false interpretation of the corresponding pictures (*handle, antlers, paddle*) in Chapter 4 will cause more mistakes to be made in terms of the selection of the target picture (*handle/cup, antlers/stag(buck), paddle/boat*), whereas the same erroneous processing of pictures in Chapter 3 will affect the processing of individual distractors, which need not necessarily lead to mistakes. Thus, an increased incidence of errors for these worksheets in Chapter 4 is to be expected for several reasons, and this should be take into account in the evaluation.

The structure of the worksheets in this chapter parallels the structure employed in the previous chapter and is as follows: in each case the target picture shows one part of an object (*handle/cup, chimney/factory*), and these are the same items which serve as distractors in Chapter 3, and consequently the descriptions in the previous chapter are also valid here. The corresponding whole to which the part belongs has been chosen as the first distractor (*cup, factory*) and is identical to the target item in the previous chapter. The second distractor, as was the case in the previous chapter, is a hyponym of the first distractor, so that all the corresponding pictures in Chapter 3 have been exchanged (*sugar bowl* instead of *lid*, *crayon* instead of *cartridge*, *church*

instead of *church tower*). The third, situational distractor is frequently new (*chimney-sweep/chimney* instead of *fork-lift truck/factory*), unless the item selected in Chapter 3 forms a situational relation to the two different target words (*priest/altar*, *priest/church*). The last, non-related distractor in this chapter is, in every case, the same as in the corresponding worksheet in Chapter 3. In addition to the changes mentioned concerning the pictures themselves, all worksheets have been arranged anew and randomised in order to diminish the influence of familiarity. In terms of the processing modalities, the descriptions in Chapter 3 are also valid here.

5 PART-OF RELATION: SEMANTIC SIMILARITY

WS	Pictures	Words
1	stag/buck, bull	antlers, horns
	fish, bird	fin, wing
2	fountain pen/ball-point pen, pencil	lead, nib/refill
	carriage, sledge	wheel, runner
3	knife, fork	blade, prong
	glass, cup	stem, handle
4	flower, tree	stalk/stem, trunk
	gate/gateway, bridge	column, pier/pillar
5	piano, violin	keys, strings
	bicycle, car	saddle, seat
6	candle, lamp	wick, light-bulb
	table, chair	top, back-rest
7	foot, hand	toe, finger
	mouth, eye	lips, eyelashes
8	cap, scarf	peak/visor, fringe
	trousers/pants, jacket	waistband, collar
9	factory, church	chimney, church-tower/church tower
	aeroplane/airplane, sailboat	wing, sail
10	fish, fox	scales, fur
	wine-bottle, juice bottle	cap, cork
11	syringe, drops	needle, pipette/dropper
	television, camera	screen, lens
12	scorpion, snake	sting/stinger, tooth
	tiger, leopard	stripes, spots
13	tree, pine	leaves, needles
	sausage, orange	peel, skin
14	stairs, ladder	steps, rungs
	cable-car, train	cabin, carriage
15	compass, clock	needle, hand
	balcony, window	parapet/railing, bars
16	octopus, spider	tentacle, leg
	lasso, fishing-rod	loop, line
17	tortoise, hedgehog	shell, spines
	bird, fish	feathers, scales
18	helmet, wedding attire	visor, veil
	tie, apron	knot, bow

Chapter 5 consists of a total of 18 worksheets, all of which have the same structure. Two pairs of pictures are arranged on each sheet. The two pictures in each pair represent semantically similar items; in most cases hyponyms (*carriage/sledge*, *hand/foot*, *tiger/ leopard*). In each picture, one part of the whole object is identified by means of an arrow. The terms for the parts of the whole, which are shown by the arrow, are written above the pair of pictures in random order and should inserted (in writing) by the patient. The items have been selected such that in addition to the respective wholes being connected through (hyponymic) similarity, the individual parts which should be named are also similarly linked (mostly via functional similarity) (e.g. *wheel* and *runner* / *carriage* and *sledge*, *finger* and *toe* / *hand* and *foot*, *stripes* and *spots* / *tiger* and *leopard*).

The structure of this chapter should consolidate/reorganise, firstly, the systematic processing of concepts from widely differing semantic fields belonging to a specific relation (part-of relation) and, secondly, the corresponding links, in contrast to parallel connections. Furthermore, the worksheets have been so constructed that the corresponding hyponymic relations are activated.

The concepts selected for this chapter are, for the most part, frequently used basic concepts (*flower/tree*, *bicycle/car*, *table/chair*), many of which have already been used in previous chapters; some more unusual concepts have been included (*scorpion/snake*, *lasso/fishing-rod*, *helmet/wedding attire*) in which the part-of relation is particularly striking (*sting/tooth*, *loop/line*, *visor/veil*). As the terms for the individual parts only occur as the target words for the matching exercise, the complexity or infrequent use of the words which identify the whole object is not relevant here.

The comments on the structure of the target words resemble those which have already been made at various points concerning the characteristics of this word class: the target words are often words which are relatively infrequently used but which can be employed either in a variety of ways (*stripes/spots*), or idiosyncratically (*visor*) and, as a whole, they are relevant not so much as a result of these characteristics but rather because of their classificatorial system - since it is well documented that access to nominal concepts is possible via a variety of channels and, therefore, also by means of the part-of relation.

The pictures included in this chapter exhibit a characteristic which is both a strength and a weakness: as already mentioned elsewhere, there is a danger when making a visual representation of individual parts of an object that the level of distinctness and the ease of identification decreases drastically; this does not apply to this chapter, as here the part is always seen in the context of the whole. On the other hand, the processing of parts of a whole which are marked by arrows gives rise to other problems (ambiguity, visual separation of the part in question). If patients experience difficulties with these characteristics of the task, we recommend that the arrows and/or the parts be marked in colour.

The information previously given concerning practical and suitable methods of processing these kinds of worksheets is also valid here. In addition to the words which have been written on the worksheets, it is possible to deblock, to find, or to match the terms for the whole objects. It is also possible to

use simple sentences of the form ‘a ..... has a .....’.

6 PART-OF RELATION: CONCEPT

WS	Pictures	Words
1	fish	gills, fins, mouth, tail
	shirt	collar, arm, button, pocket
2	house	door, window, roof, chimney
	letter	address, sender, stamp, envelope
3	horse	hoof, mane, tail, nostrils
	window	handle, pane, frame
4	tree	trunk, branch, root, leaf
	watch	hand, face, case, strap
5	bicycle	handlebars, luggage carrier/carrier, saddle, tyre/tire, lamp, pedal
6	ship	anchor, hull, funnel, bow, bridge, flag, stern, mast
7	hand	thumb, index finger, middle finger, ring finger, little finger, back of the hand, wrist
8	leg	foot, toes, ankle, knee, thigh, calf, shin
9	face	eye, nose, mouth, cheek, forehead, chin, eyebrow
10	camera	lens, shutter release, flash
	wardrobe	door, clothes-rail/bar, linen shelf
11	book	jacket, spine, pages, cover
	television	antenna, screen, on/off switch
12	pan/pot	lid, handle, base
	rifle	barrel, trigger, stock
13	PC/computer	screen, keyboard, mouse
	bed	pillow, mattress, cover, foot of the bed, headboard
14	washbasin/sink	tap, plug, overflow/soap dish, waste pipe
15	car	tyre/tire, hood/rag top, windscreen/windshield, headlight, bumper, bonnet/hood, wing/fender
16	chair	leg, back-rest, seat
	glasses	lens, bridge, frame
17	oven/stove	hot-plate, switch, oven
	desk-lamp	bulb, shade, switch
18	shoe	heel, sole, lace, upper
	aeroplane/airplane	wing, jet-engine, cockpit, tail fin
19	motorbike/motorcycle	mirror, handlebars, tank, seat, mud-guard/fender, motor
20	violin	bow, tuning peg/body, strings, neck
	bird	wings, tail, beak

Chapter 6 deals with the picture-semantic processing of conceptually important parts of concrete objects. Some pictures have been borrowed from previous chapters; however, new pictures have also been included.

The pictures which have been selected represent, in most cases, frequently encountered, simple objects from everyday life, animals and parts of the human body. There are a total of 34 pictures, which are arranged either in pairs or alone on each worksheet. In each picture, a varying number of details should be identified with the help of arrows; the words which are listed above each picture should be matched to the appropriate part. Many of these words have already been encountered in previous chapters. The comments already given concerning these words are also relevant here.

In order to provide material for patients with less severe impairments, this chapter includes a number of pictures which require the matching of very specialised, infrequently used words to the details in the pictures. These are words which are certainly not present in every subjective vocabulary.

The worksheets can be used just as flexibly as those in previous chapters, but they are especially suitable for written matching exercises and both the oral and written naming of details and complete objects.

7 SEMANTIC FIELDS

WS	Semantic Field	Words/Pictures
1	domesticated animals	dog, cat, cow, pig, sheep, chicken
2	forest animals	deer, stag/buck, fox, mouse, hare, owl
3	wild animals	tiger, lion, elephant, giraffe, bear, wolf
4	garden flowers	tulip, daffodil, rose, carnation, crocus, gladiolus
5	wild flowers	dandelion, violet, daisy, poppy, snowdrop, lily of the valley
6	fruit	apple, pear, cherry, banana, grapes, plum
7	fruit/berries	pineapple, peach, raspberry, strawberry, blackcurrant, gooseberry
8	vegetables 1	carrot, green bean, cucumber, pepper, tomato, leek
9	vegetables 2	lettuce, radish, cauliflower, asparagus, peas, pumpkin
10	body parts	hand, foot, leg, arm, back, head
11	clothing	trousers/pants, skirt, dress, jacket, pullover/sweater, shirt
12	furniture	chair, table, bed, wardrobe, armchair, shelves
13	crockery	cup, plate, teapot, bowl, pitcher, mug
14	cutlery	knife, fork, soup-spoon/soup spoon, tea-spoon/tea spoon, ladle, cake slice/pizza cutter
15	bread toppings and spreads	butter, margarine, jam, honey, salami, cheese
16	bakery products	bread, roll, cake, croissant, pretzel, biscuits/cookies
17	tools	hammer, saw, plane, drill, pliers, file
18	play area	sandbox, slide, climbing-frame/jungle gym, swing, see-saw, carousel
19	toys	roller-skate, kite, scooter, tricycle, legos, car
20	garden tools	lawnmower/mower, hose, rake, spade, hoe, sickle
21	buildings	house, church, skyscraper, tower, railway station, school
22	musical instruments	violin, trumpet, saxophone, guitar, flute, piano
23	means of transport	aeroplane/airplane, bus, lorry/truck, train, helicopter, ship

24	industrial vehicles	fork-lift truck/fork-lift, excavator, tractor, concrete-mixer, steamroller/steam roller, bulldozer
25	bags/baskets	suitcase, carrier-bag/shopping bag, basket, string-bag/handbag, ruck-sack/knapsack, travel-bag/travel bag
26	containers	bottle, vase, bucket, barrel, tub, can
27	jewellery	ring, bracelet, chain, brooch/pin, earrings, pendant
28	body-care	comb, hairbrush, toothbrush, toothpaste, soap, skin cream
29	cosmetics	eye-shadow, nail-polish, lipstick, mascara, powder, eyeliner
30	first aid	plaster/Band-Aid, bandage, ointment, tablets, drops, syringe
31	insects 1	spider, dragonfly, grasshopper, earwig, ladybird/ladybug, centipede
32	insects 2	bee, stag beetle/beetle, butterfly, fly, ant, mosquito
33	sport articles	skittle/bowling pin, ice-skate, tennis racket, skis, football/soccer ball, rubber dinghy/rowboat
34	garden furniture	deck-chair/deck chair, sunshade/garden umbrella, awning, garden-chair/garden chair, park-bench/park bench, sunbed/chaise longue
35	office items 1	hole-punch/tape, file, stapler, stamp, glue, tray
36	office items 2	typewriter, calculator, telephone, dictaphone/dictating machine, PC/computer, fax machine
37	cooking utensils 1	lemon-squeezer, sieve, measuring jug/measuring cup, grater, coffee-filter, corkscrew
38	cooking utensils 2	coffee machine, toaster, hand-mixer, bread-slicer/blender, food-processor, microwave
39	electronic equip-ment	television, turntable, radio, cassette recorder, CD player, video recorder
40	car accessories	warning triangle/jumber cables, roof-rack, petrol-canister, first-aid box, tow-rope, jack
41	countryside	wood, mountains, coast, desert, savannah, jungle
42	birds	owl, parrot, seagull, vulture, stork, pelican
43	young animals	lamb, calf, foal, piglet, chick, faun
44	shoes	sandal, boot, ladies' shoe, sports shoe/tennis shoe, slipper, laced shoe
45	glasses	beer glass, wine glass, champagne glass, tumbler, cognac glass, sherry glass
46	lamps	desk-lamp/desk lamp, standard lamp/floor lamp, bedside-lamp/bedside lamp, ceiling lamp, torch/flashlight, street-lamp/street lamp
47	clocks/watches	alarm-clock/alarm clock, wrist-watch, grandfather clock, pocket-watch, sta-tion clock, egg-timer
48	ships	yacht/sail boat, rowing boat/rowboat, steamer/steam boat, rubber din-ghy/rubber boat, canoe, ferry/cruiser
49	professions	priest, doctor, pilot, policeman, conductor, teacher
50	generations	father, mother, son, daughter, grandfather, grandmother
51	animals/young 1	deer - faun, cow - calf
52	animals/young 2	sheep - lamb, horse - foal

In the 52 worksheets presented in this chapter, each of which contains 6 pictures, we have attempted to cover the most important basic concepts from fundamental, everyday semantic fields and, in addition, some fields 'below' the basic concept level (shoes: *sports shoe/tennis shoe, sandal, boot, ladies' shoe, slipper, laced shoe*) as well as basic family relations (*mother, father, daughter, son, grandmother, grandfather*). Many of the pictures employed here (approx. two-thirds) have already appeared in other chapters either as a target word or distractor; the remaining third have been included in order to cover all important areas and to ensure the completeness of the fields.

The combination of the pictures was chosen so as to fulfil the following criteria: six visually different, hyponymic concepts were required which were as prototypical as possible and which lent themselves to clear visual representation; the words which represent these

concepts should be phonematically and graphematically as simple and distinct as possible and be classifiable under a superordinate term either implicitly or explicitly. Most of the worksheets consist of six pictures of this type (*hammer, saw, plane, drill, pliers, file*) and the corresponding terms in random order; these pairs can be matched and the terms written in the spaces provided. In addition, some word fields were included which require the use of phonematically/graphematically more complex words, in order to increase the level of difficulty (*warning triangle/jumber cables, roof-rack, petrol canister, first-aid box, tow-rope, jack*). For the same reason, we have included some worksheets with pictures which require access to special terms below the basic concept level (*yacht/sail boat, rowing boat/rowboat, steamer/steam boat, rubber dinghy/rubber boat, canoe, ferry/cruiser*). In only very few cases is there no clear semantic-classificatorial relation between the items used, but rather a situationally based relation (*comb, hairbrush, toothbrush, toothpaste, soap, creme/skin cream*). The decisive factor for inclusion in these cases was the everyday relevance of these words, which otherwise could not have been included.

In spite of considerable effort, it was not always possible to maintain constant phonematic-graphematic or morphological complexity for all six words (*ring, bracelet, chain, brooch/pin, earrings, pendant*): ultimately, the aim was to achieve a semantic mixture which was as balanced and as relevant as possible in terms of familiarity, clarity of visual representation and frequency of use. Some semantic fields were divided between 2 worksheets, either because they were especially comprehensive or because they could be divided into two sub-fields of differing degrees of difficulty (fruit 1 and 2, insects 1 and 2). A few worksheets require access to professional or gender-specific concepts which are less intersubjective (*cosmetics, jewellery, industrial vehicles, office items 2*). Nevertheless, the great majority of items are frequently used, relevant to everyday life and simple. The worksheets in this chapter can be employed in as many ways as the therapist has ideas. They can be used in aural exercises, in written exercises or in combination, for naming, matching, finding superordinate terms, either with or without written prompts, as complete worksheets or in cut-up form etc.

8 SITUATIONAL RELATIONS

WS	Words/Pictures
1	skirt, wardrobe
	newspaper, glasses
2	ear, radio
	frying-pan, oven
3	bone, dog
	tulip, vase
4	trousers/pants, suitcase
	log, table
5	bread, knife
	football/basketball, referee
6	slipper, armchair
	stag/buck, forest
7	petrol station/gas station, motorbike/motorcycle
	ring, hand
8	evening-gown/evening gown, champagne glass
	saw, branch

9	pilot, aeroplane/airplane
	brush, fence
10	baker, bread
	wool, pullover/sweater
11	pig, salami
	basket, leek
12	doctor, syringe
	house, bricklayer
13	jungle, tiger
	grapes, wine-bottle/wine bottle
14	butcher, salami
	bread, wheat
15	meal, chef
	postman/secretary, letter
16	flour, cake
	house, brick
17	wool, sheep
	stairs, balustrade/rail
18	key, lock
	camera, film
19	rider, horse
	teacher, blackboard
20	traffic light, cross-road
	compass, circle
21	milk-bottle/milk bottle, refrigerator
	milk-jug/milk jug, sugar-bowl/sugar bowl
22	foot, shoe
	sandal, sun
23	book, shelves
	skin cream, face
24	plait/braid, brush
	ear, clips
25	tower, steps
	carpet/rug, vacuum cleaner
26	rucksack/knapsack, forest
	seagull, ship
27	pineapple, jungle
	butterfly, flower
28	nail, picture
	circus tent, elephant
29	nest, tree
	fountain pen/ball-point pen, letter
30	rowing boat/rowboat, lake
	drawer, underwear
31	crutch, leg
	gun, deer
32	washbasin/sink, hand
	head, cap
33	train, tunnel
	cow, milk
34	carrot, hare
	belt, trousers/pants
35	fish, frying-pan
	mouth, lipstick
36	crane, skyscraper
	money, shopping bag

Not all semantic errors can be explained as the defective processing of classificatorial semantic relations. For example, many instances of false naming are clearly the result of a situational relationship between the target word and the semantic paraphasia. For this reason, we have taken situational relations into consideration in previous chapters through the selection of appropriate distractors. Situational relations play an important role in the incidence of false naming, especially in severe cases of aphasia.

In the present chapter, 144 pictures, which have been used in previous chapters, have been grouped together in new combinations: two pairs of pictures appear on each of the 36 worksheets together with their corresponding terms. Various situational relations were used as the basis for the grouping of the item pairs: the majority of the picture/word pairs are characterised by a pragmatic-contextual relation, i.e. the two objects which are visually represented often appear in the same everyday activity context (*frying-pan/oven, postman(secretary)/letter, money/ shopping bag*). We include many situational relations which consist of a product and either the material from which this is made or its creator (*flour/cake, house/bricks, baker/bread*). Instrumental (*doctor/syringe, saw/ branch, compass/circle*) and local relations (*wardrobe/skirt, stag(buck)/forest, fish/frying-pan*) also form a significant part of this chapter.

As already mentioned , if a large number of situational-referential errors are made by a patient, this is indication of either a disorganisation of hierarchical-classificatorial relations within the se-

mantic system or impaired access routines. If such difficulties are observed (e.g. in the receptive processing of the worksheets in the first two chapters), then the present chapter provides a suitable introduction to activities which focus on word semantics. The setting (only 2 items in each task) is simple and facilitates the achievement of a high success rate. Only in this chapter will the therapist find material with which patients whose classificatorial relations are severely impaired are able to work independently and successfully during the initial stages of therapy.

The worksheets presented here can also be employed effectively for patients whose impairments are less severe, e.g. by making use of them as stimuli for sentence building exercises via an extension of the usual word processing modalities (*dog/bone: the dog is eating a bone, tulip/vase: the tulip is in the vase*).

9 HOMOPHONES

WS	Word	Pictures
1	bow	violin bow, keyboard, arrow, fishing rod, comb
2	nail	fingernail, tooth, screw, nut, chick
3	ball	dance-ball, theatre stage, shuttle-cock/boomerang, goal, mouse
4	ring	boxing ring, tennis court, bracelet, hand, petrol canister/gas can
5	lace	lace, veil, sandal, ribbon, tree
6	fork	fork of a bicycle, motorbike handlebars/motorcycle handlebars, spoon-handle, knife, owl
7	bank	financial institute, money, lock, rat, apple
8	band	band of robbers/band of musicians, football team/soccer team, hair-clip, brush, cheese
9	comb	cock's comb/rooster's comb, hen, brush, braid, barrel
10	crown	king's crown, bob-cap/cap, log, bush, television
11	conductor	conductor, band, train, railway station, ear of wheat
12	calf	young cow, foal, foot, lower arm, crane
13	lock	lock, ship, key, handle, hat
14	plane	aeroplane/airplane, helicopter, saw, file, tie
15	peak	peak of a cap, scarf, valley, mountain climber, toothbrush
16	jam	traffic-jam, motorway/highway, cheese, bread, PC/computer
17	pen	sheep, stables, pen, ink/letter, tennis racket
18	key	door-key, door-handle, calculator , PC monitor/computer monitor, grapes
19	file	file, hole punch/hole puncher, hammer, pliers, strawberry
20	train	train of a wedding dress, veil, railway station, bus, glasses
21	bar	bar, champagne glass, ballet slipper, stage, camel
22	sole	sole, octopus, boot, lace, book
23	boot	boot, car, sandal, tree, steering-wheel
24	trunk	trunk of an elephant, tail, branch, leaf, ship

The present chapter focuses on a setting which concerns a peripheral area of picture-semantic processing, namely the relationship between representations which are phonlogically identical but semantically distinct. The target words are homophones, i.e. terms which are characterised by having one entry in the phonological lexicon which corresponds to two entries in the semantic system (*bow*: 1 violin bow / 2 weapon, bow and arrow). In contrast to previous chapters, where the patient was required to make fine semantic dif-

ferentiations between related or overlapping concepts, the concepts to be processed here are semantically distinct, i.e. there are two different ways of interpreting (reading) the one phonological form of the word. This is also the reason why homophones do not lead to erroneous interpretation in everyday language use, since a simple contextual framework excludes one of the possibilities. It is possible that for many homophones one of the meanings is predominant and receives preference in the order of activation, while the other is only selected in the presence of critical contextual information.

Due to the context-free presentation of the tasks in this chapter, it is not possible, initially, for the patient to decide on one of the interpretations of the given word. Commencing with the phonological form of the word, two distinct concepts are addressed in the semantic system. This ambiguity can only be resolved if both forms (of interpretation) are present so precisely and to such an extent that, during the processing of the three related, visually represented misleading terms and the target picture, one of the two concepts represented in the semantic system is activated and, at the same time, the other is suppressed.

In comparison to other chapters, the exercises presented here require more intensive monitoring. It is not surprising that patients whose semantic differentiation skills are adequate for differentiating between very similar concepts may make errors in tasks such as those presented here.
This chapter consists of 24 worksheets, each containing five pictures and the printed target word. Twenty-four homophones have been chosen as target words, and the previously employed criteria concerning complexity and frequency have been observed as far as possible in both interpretation forms; at least one form can be clearly represented in visual form. We have not considered the question of dominance.

In each case, one of the forms of interpretation serves as the basis for the target picture (*bow*: violin bow, *nail*: fingernail, *bank*: financial institute). Instead of the second form of the homophone, we have selected stimuli which form a close relation to it - in most cases hyponymic or an other classificatorial relation (instead of *bow* (weapon): *arrow*, instead of *nail* (tool) : *screw*, instead of *bank* (landscape): *lock*).

In addition to these two pictures, which are based on the two different forms of interpretation of the homophonic stimulus word, three further distractors have been added, of which two are constructed from the first and the second form of interpretation, respectively (*bow: keyboard, fishing rod; nail: tooth, nut; bank: money,* rat), and the third has no relation. The relational distractors are chiefly classificatorial and, to a lesser extent, situational-pragmatic in nature.

This chapter is suitable for checking whether patients suffer from a dissociation between the semantic system and the phonological lexicon within the context of picture processing. If one wishes to apply this chapter more for therapeutic than diagnostic purposes, various techniques should be explored which support the processing of phonological-semantic relations. For example, it may be advisable to present the homophonic words initially without the pictures (aurally or visually) and require the patient to ‘describe, signal, or draw the meaning of the word’, or ‘to explain or illustrate the two meanings’ prior to asking the patient to view the pictures. It may also be beneficial to involve patients who are less severely impaired in

a meta-linguistic exchange on the relations between the homophonic word forms and the pictures.
In conclusion, these worksheets, irrespective of their special structure, are as suited as those in previous chapters for matching, comprehension and naming exercises.

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[1] The logogen model employed here corresponds to the Blanken version (1991) with the inclusion of visual object and picture analysis.

[2] Spontaneous utterances and free writing normally require language processing on the sentence level which goes beyond single word processing; sentence processing includes, but is not confined to, the processing of individual words.