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D-scripts model for speech influence and emotional dialogue simulation

Abstract

In the present issue we represent and discuss a general structure of a model for functional description of speech influence effects. The model was developed to give unified interpretation to diverse examples of manipulative texts, corresponding mainly to election campaigns from 1999 to 2003. The model also applies to several other types of emotional communication, in particular to some types of conflict, speech aggression, complaint etc. The model gives a specific definition to the notion of speech manipulation mean, and serves as a basis for its' inventory development and description.

Introduction

The proposed model relies on the component of text \Leftrightarrow meaning processor [1, 2] and cognitive component for inference modelling (see Fig.1). We can assume that during regular text processing the text arrives on the input of text-to-meaning processor, which constructs a text semantic representation. Further, the semantic representation is processed by units of cognitive component – rational scripts (r-scripts). Each r-script is an "if – then" operator, it activates when "if" condition (starting model) is found in the text meaning and constructs "then" representation (target model). The result of cognitive processor can be a rational behaviour program or a semantic representation to construct an output text.

To simulate the emotional processing of semantic components we append to the model a set of dominance scripts (d-scripts). We define d-scripts in a unified way with r-scripts: as "if – then" operators. D-scripts dominate during the process of text comprehension, and activate each time "if" condition (d-script starting model) is found in the text or it's corollaries. In general case a d-script is activated by semantic representations, where an aggressor (AGGR) threatens a victim (VICT). This model gives a functional definition to speech influence, which is defined as an intentional activation of any d-script during text analysis. In particular, certain d-script DECEPT stands for the situations of deception. The d-script activates each time, when the model discovers a situation of deception against itself in the incoming texts. The activation of the d-script may result flight or aggressive behaviour – both reactions defined by target models of the d-script.

Starting and target models of a d-script may provide meaning for constructed texts. If the model has received a text, roughly corresponding to a d-script starting model, it may reply with a closer representation of the starting model (a), or, if it has passed the d-script to some target model – with a representation of aggressive (b) or flight (c) target models.

- (1) – *Your city administration doesn't tell you the truth!*
(the model activates DECEPT d-script and may reply with one of the following utterances)
(a) – *Oh! They always lie!* (d-script starting model)
(b) – *Oh! I have to blow them up!* (aggressive target model)
(c) – *Oh! It's time to move out from this city!* (flight target model)

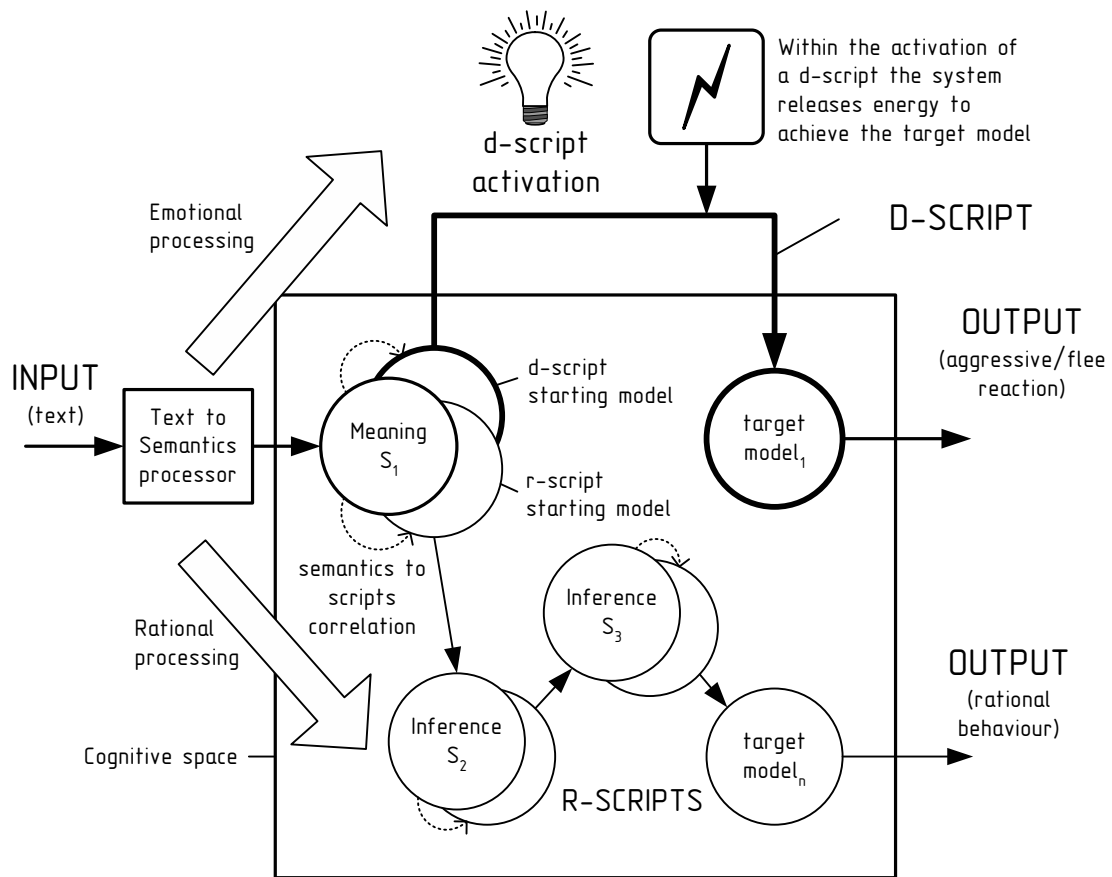


Figure 1. General structure of a model for description of emotional speech behaviour

Input texts are processed by a Text-to-Meaning model, which is constructing semantic representation (text meaning). Further, the semantic representation launches processing mechanism, defined by scripts (if-then operators). Each script includes starting and target representation – it is activated by semantic components, corresponding (though not exactly) to the starting models, and is constructing target models. Thereby an inference chain is represented by a chain of scripts. The difference between “emotional” and “rational” text processing is represented by scripts of different kinds: emotional processing activates d-scripts (only one d-script is shown), while rational processing activates r-scripts. As a result of processing the system may construct a target model and execute a corresponding behavioural program. It can be a “rational” behaviour, if initiated by r-scripts, or emotional reaction, if initiated by d-scripts. For the considered list of d-scripts only aggressive or flight reactions are possible. With certain modifications the model corresponds to H-Cogaff architecture [3].

An example of d-script: SUBJV

As an example we can discuss d-script Subjectivity (SUBJV), which is revealed in sentences (2) *You think only about yourself* (conflict) and (3) *Government is concerned only about it's salary* (influence or complaint). Starting model of the d-script can be defined in the following way:

SUBJV(AGGR, VICT [, P] [, M₁(goal)] [M₂]): AGGR doesn't consider relevant factors of the situation and is effecting or is going to effect [all the possible] actions P upon discovering of situation M₂ or for achieving a goal M₁.

The definition of a d-script includes also a list of "critical elements" – semantic markers, which value can be shifted in order to facilitate the activation of a d-script in communication. A notion of a "critical element" can be illustrated as follows. If the addressee comes late, we can put him to shame if we increase the time of his delay, for example, we can say: (4) *I'm waiting you already for one hour!* (even if we are waiting less). The time-of-delay acts as a critical element if accusing somebody in being late, it can be recorded as <delay time>⁺. The more we shift the time of delay – the more the addressee is ashamed (but if we increase the time too much the addressee can falsify our statement). The analysis of mass media and conflict texts gives us a notion on the list of critical elements for each d-script. Above all, the following shift elements are relevant to d-script SUBJV:

<number of AGGR>⁺ e.g.: *Everybody thinks only about himself!*
 <timeframe for P>⁺ e.g.: *He always speaks about football!*
 <inevitability of P if M₂ occurs>⁺ e.g.: *He definitely has to bark at each cat!*
 <time interval between M₂ and P>⁻ e.g.: *When a central heating damage occurs, local administration immediately declares, that this is a fault of condominium!*
 <intensity of P>⁺ e.g.: *Why do you start shouting, when I say about the washing machine?*

We expect, that an addresser in emotional state (having activated a d-script) will shift meaning of his text, as defined by critical elements. Further, an addresser, who wants to affect a listener (to activate his d-script) will shift the meaning in the same way, but maybe with more accuracy – for not to make his plan evident.

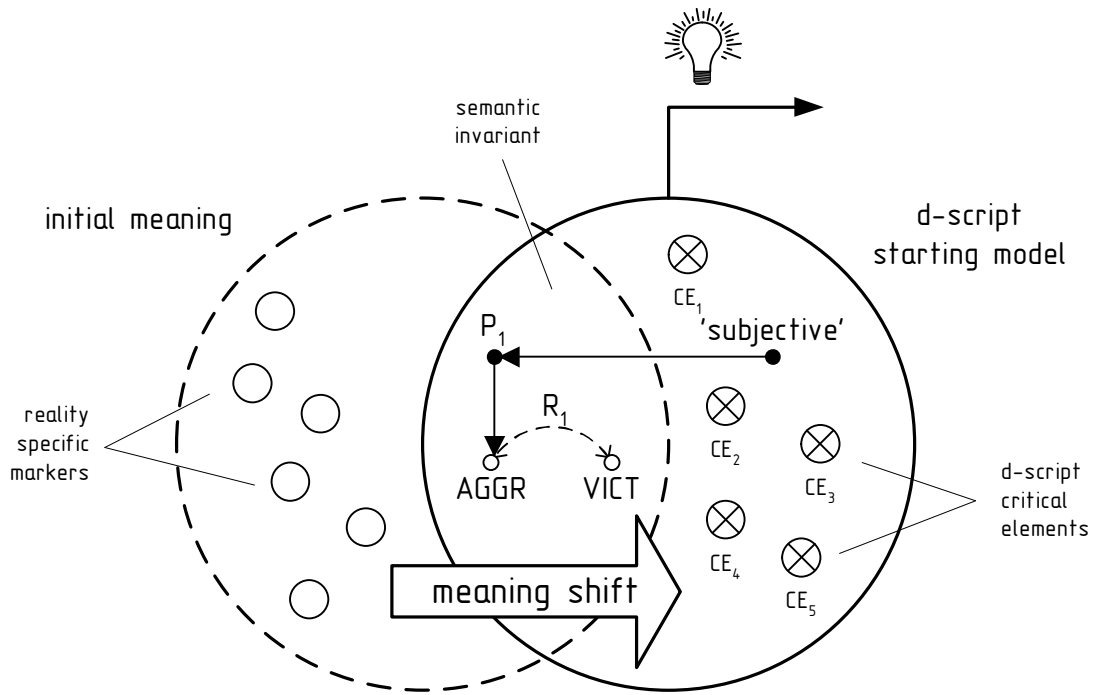
Properties of d-scripts

We can define a list of properties for d-scripts, which give functional interpretation to several phenomena, noticed in respect to speech influence and emotional communication. In particular, people in emotional states try to shift the meaning of incoming texts. The same corresponds to people, trying to affect others: they shift a text interpretation of a given fact. People not only shift the meaning, but they also believe that starting models are real – they believe in plots, deceits and subjective actions of others. Further, people speak about situations, which correspond to d-script starting models: people discuss plots, deceits and how awful everything is around them.

A. Initial sentence meaning is shifted by a person, who has activated a d-script or wants to activate d-script of his opponent

If a person is affected by a text – he will transform it's meaning, as defined by shift elements of the activating d-script, e.g.:

- (5) - *The government is working on the budget already for one month.*
 - *They always shout about such trifles.*



(A) - *Government is working on the budget.*

(B) - *They all always cry only about their budget!*

Figure 2. Meaning shift, forced by a d-script activation (emotional state), or made with the purpose to activate a d-script of addressee (speech influence) D-script may capture meanings, shifting and assimilating them with the starting models of the d-script. During the meaning shift the reality specific semantic markers are omitted (e. g. *government* may turn to *they*), while critical elements of the d-script are expressed (e. g. *they* may turn to *everybody*, and *discuss* may turn to *cry*). Such meaning shift may be effected by an addresser in emotional state (an addresser, who has activated a d-script), or by an addresser, who wants to manipulate the addressee, and activate his d-script.

The meaning shift in representation of entire situation as well as in representation of each actant corresponds to the theory of situational representation of concepts [4, 5].

B. D-scripts are persuasive

A communicant, who has activated a d-script, is quite sure about the actuality of it's starting model. If, for example, basing on certain texts and observations a person has activated SUBJV d-script and came to an idea, that 'government is eager to deal with useless matters' (SUBJV), he would be quite sure about this sentence. Further he will search for the confirmations of this thesis in all incoming texts, making corresponding meaning shifts.

C. Activation of d-scripts generates communication stimuli

Activation of a d-script makes an addresser initiate communication. The only goal of such communication is to transfer the semantic representation, corresponding to the starting model of a d-script, or to discuss actions, defined by target models.

D. D-scripts compete with r-scripts during text interpretation

As d-scripts are defined in a unified way with r-scripts, the mechanisms of rational inference, we can give a functional interpretation to the fact, that the same text can be processed in emotional way (with the help of d-scripts) or in rational way (with the help of r-scripts). The emotional way is preferred, when a person has certain predisposition to activate a d-script (e.g. was activating d-scripts in respect the same matter before) or if a text meaning is closer to the starting model of the d-script (e.g.: *Government betrays*, instead of *Government was not correct*).

Discussion on the register of d-scripts

In wide sense the proposed notion of d-script should serve all the possible reactions, which may be started by the meaning of incoming texts. At least, if we try to develop quite a complete model of text processing and emotional speech simulation, we have to define maximum of possible reactions. Meanwhile the inventory, studied so far, is quite limited and includes 12 d-scripts.¹

We study two main groups of d-scripts. Units of the first group regulate the relations of a communicant with a possible enemy. They detect representations of “Danger” (*Nowadays is is dangerous to go outside of your home!*), “Deceit”, “Manipulation” (*TV programs control your consciousness*) etc. D-scripts of the second class regulate relations in a social group, mainly, between the communicant and the head of the group. They are activated, if the head of the group is “Inadequate” (*Prime minister blames far east inhabitants for the desire to found Urals republic! You mother doesn't understand, what she says!*), “Inconsistent” (*The president just said one, and immediately quite the contrary!*), “Emotional” (*Why is he shouting all the time?!*), etc. The d-script SUBJV corresponds to this particular group. These d-script may start a flight reaction (to escape from the enemy or to leave the suppressing group), or an aggressive reaction (to chase away the enemy or to remove the head of the social group), which if restrained may reveal in political context as voting for opposition. D-scripts of the two proposed groups are quite sufficient for studies of “negative” propaganda and mass media texts.

First of all, the limitation on the considered list of d-scripts is defined by the specific of texts, used as a material for the development of the model. These are Russian publicistic texts – mainly texts with negative propaganda during election campaigns. Second, these d-scripts are comparatively easy to describe, as they are activated by representations of some real world situations, for example, a situation of deception or subjectivity. Such situations have certain logical structure and can be described on the same metalanguage, as used for lexical definitions. It is evident, that utterances like (6) *It is so nice here!* can be described as constructed by some d-script, activated by a certain degree of being ‘nice’ (or, widely, delight). We can assume that such d-scripts are quite numerous, and attempts to describe their starting model on a standard metalanguage for lexical definitions (even if we add the inventory of critical elements) would be less successful.

We consider the list of d-scripts as an open research project which we try to develop in several areas. First, we try to verify and falsify the list of d-scripts on a bigger number of mass media texts. This verification, above all, includes checking the ability of d-scripts, to describe particular manipulative examples. Second, we work on development of text expertise procedure with a group of linguists, engaged in forensic text examination². Third, with psychology research group³ we try to collect text material of emotional discourse within

¹ The current register of d-scripts is available at the following address:

<http://www.harpia.ru/d-scripts-en.html>

² The Guild of Linguists-Experts on Documentation and Informational Disputes, Moscow:

<http://www.rusexpert.ru/>

³ Vygotsky Psychology Institute, Moscow: <http://www.psychology.nm.ru/>

series of experiments. These approaches, as we expect, would make the list of d-scripts, its' critical elements and their possible language representations more definitive and complete.

Roles in emotional communication

Addresser and addressee can distribute the valencies of AGGR and VICT in different ways. On one hand our model can activate d-scripts when receiving texts like (7) *Your mother doesn't tell you the truth* (it will consider itself as a victim - VICT, while 3rd person – mother – as an aggressor, AGGR) on the other hand, it can produce texts like (8) *Government is always lying to you!* (when trying to affect the opponent and make him believe, he is a victim of some other aggressor) or (9) *You are always lying to me!* (in conflict communication, where the addressee is believed to be the aggressor). Different types of such distribution give functional base to classify several types of emotional communication, as follows:

	Role of addresser	Role of addressee	Role of 3 rd party	Thesis of addresser
1.	VICT	AGGR	-	Conflict: <i>You are concerned only about your football. You, politicians, are only concerned how to speak well.</i>
2.	VICT	-	AGGR	Complaint: <i>My husband speaks only about his football.</i>
3.	VICT	VICT	AGGR	“Communication of victims”: <i>Modern youth think only about dances!</i>
4.	-	VICT	AGGR	Influence: <i>Government thinks only about their taxes.</i>

Table 1. Expectations of addresser on the distribution of AGGR and VICT valencies

During a communication the addresser may distribute the roles of AGGR and VICT in different ways. Addresser may believe, he is VICT, while the addressee or some 3rd party is AGGR (conflict and complaint); that both communicants are VICT of some 3rd aggressor (“communication of victims”). Addresser may also try to persuade addressee that he (addressee) is a VICT of come other AGGR (influence).

We have to notice, that the structure of communications, defined by the lines of the table was widely investigated in linguistics and psychology. In particular, Eric Berne has described so called here “communication of victims” as a type of interpersonal interaction – a “game” “Ain't It Awful” [6].

As expected, the represented general model, consisting of text to semantics component, cognitive component (r-scripts) and d-scripts set can be used to simulate speech effects and speech behaviour in certain types of emotional communications. Further, we use this model to study the mechanisms of text comprehension and operations with semantic components in more complicated texts, aimed on speech influence.

Speech manipulative means, an example

The utterances, directly corresponding to the starting models of d-scripts, like (10) *The government is lying to you!* can hardly affect a critical addressee. We expect, that a “clever” listener would either activate an r-script to process this utterance in a rational way (like to make a conclusion, that he is speaking with an emotional addresser) or would activate a d-script, not expected by the addresser (like getting afraid, that somebody is trying to

manipulate him – activating a d-script “Manipulation”, where he himself is VICT, while the addresser is AGGR). In both cases addresser fails to affect listener, as he expected.

To manipulate a critical listener one has to use special speech means to construct latent starting models of d-scripts and to bypass undesirable reactions (like undesirable rational or emotional processing). We expect, that different ambiguous language segments and different speech processes, providing slight shifts of meaning, may be used to construct starting model of a d-script without direct declarations, without saying *They are lying!* Basing on the material, studied so far, we have selected 41 types of speech manipulative means⁴, which fall into 4 general classes: a) usage of ambiguous nominative and reference means, b) meaning shift during inferences (operations with r-scripts), c) irony and reconstruction of “plans” of other people, e. g. politicians (these two mechanisms are very well linked with each other) and d) usage of properties of communication (change of communicative roles, change of utterance authorship, etc.). We briefly refer here to usage of lexical homonyms as a mean of manipulation.

Lets consider the following example from a TV program of S. Dorenko. Dorenko argues, that A. Chubais (prime minister at the time of the program) is going to establish a food tax to secure his political positions: (11) *Each person for each piece of bread will pay for the reputation of Chubais as a brilliant economist.* We assume that during the analysis of this utterance an addressee is constructing a combined representation of the situation: ‘I pay for bread and suffer because of Chubais’. One part of this representation – ‘I pay for bread’ – corresponds to reality and can be verified by an addressee. The other part of this representation ‘I suffer because of Chubais’ has to affect the addressee and activate his d-script, responsible for ‘suffering’ and ‘loss of resources’. These representations are combined, thanks to the specific of homonyms processing – in this case the two representations correspond to different meanings of the word *to pay*: ‘to transfer money’ and ‘to suffer’.⁵ We think, that during homonyms processing the two meanings are reconstructed and divided consecutively. In this case the addressee stops processing, having a joint meaning with ‘real’ and ‘affective’ parts. This case is different from a pun, as the two meaning are not distinguished.

Main references

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⁴ The list of speech manipulative means is represented for discussion at <http://www.harpia.ru/methods/>

The classification is represented only in russian.

⁵ The relation between the meanings can be also defined as distant polysemy.