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Formulation and reformulation procedures in verbal interaction between experts and (semi)laymen*

This paper is included within the field of discourse production studies and has the aim of analyzing formulation procedures in a particular type of text: the oral interview held between specialized journalists and scientists as a previous step to writing a science popularization text intended for laymen. I will assume that text production or formulation proceduresⁱ are a field of study on their own within the broader area of discourse studies. Thus, this article should be included within studies based on linguistic and textual research carried out at the formulation level (Antos 1982) and into the recurring formulation procedures used by speakers in their linguistic productions (Gülich and Kotschi 1995 ; Gülich and Kotschi 1996). In this sense, the article attempts to contribute to the field of textual studies at the formulation level and to scientific communication studies in that the analysis and discussion of linguistic problems presented here are focused on a specific discourse type of the field.

Research on texts communicating specialized knowledge has traditionally focused on written samplesⁱⁱ. Only recently have interesting studies on oral discourse in the professions appeared, which include professional-lay discourse (Linell 1998; Linell and Sarangi 1998). The emphasis on written texts is probably due to prevailing conceptions of science popularization, among other reasons. Nevertheless, it is obvious that oral interaction between interlocutors with different degrees of expertise —basically experts and (semi)laymenⁱⁱⁱ— offer a field of great interest for the study of discourse production.

In fact, due to the general communicative features defining science popularization texts, they provide us with a “magnifying effect” where we can analyze local and global formulation problems (Antos 1982; Antos and Krings 1989). The difference in knowledge in the specific domain of the subject matter of the text (mastered by the specialist) determines a potential for communication conflicts that are paradigmatically —though not exclusively— materialized in the appearance of specialized lexicon. The scientist, who, in those face-to-face encounters, has the task of presenting and explaining a topic belonging to their specific object of study — either results brought about by or progress made in research— has to present facts and events belonging to their own field so that the specialized journalist can understand them. In doing so, they have to resort, on the one hand, to different procedures for the representation of knowledge and its verbal formulation and, on the other, to several treatments of their own speech. In fact, the scientist’s doubling back in his discourse, the reformulations, are recurrent in this type of interaction, in which the lack of symmetry in subject mastery becomes obvious.

As far as I know, formulation and reformulation procedures, together with their linguistic and functional description in Spanish texts, have barely been treated or analyzed from the point of

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view of oral discourse production^{iv}. It is my purpose in this article to identify, analyze and assess several procedures and strategies chosen by experts to formulate the content they want to convey during the interview with a journalist. Although the focus lies on experts, contributions are obviously considered as results of an interaction where interlocutors participate in solidarity with each other. Having as a theoretical mainstay the articles written by Gülich y Kotschi (1987; 1995), for oral texts in French^v, I intend to determine to what extent the procedures established by those authors are relevant and which particular forms or features they acquire in this special discourse type from a structural and a functional point of view.

The article has been structured as follows: First, I will present the most salient aspects in the background of conceptions of science popularization discourse and its constituent features. Second, I will review the theoretical foundations of my present study and present some critical issues. The analytical section comprises two parts: in the first one I will deal with the formulation procedures that have been labeled “illustration procedures” (Gülich and Brünner, forthcoming) and Gülich, in the present volume; in the second part, I will concentrate on reformulation procedures. Finally, linguistic analysis will allow us to draw some interesting conclusions about the linguistic and textual structure that these procedures adopt in Spanish, their discursive functions and, in the case of reformulation procedures, their implications for the constitution of discursive identities.

1. Antecedents and Theoretical Foundations

1.1. Science popularization texts

First of all, one may inquire about the major conceptions of science popularization in linguistic literature (which in itself is not very extensive). Due to the essential characteristics of science popularization texts (participants in the communication process, reference worlds involved, terminology, and so on), what we may call the traditional model of this type of texts has prevailed for many years. To accept this model we have to assume that there is a somewhat elementary three-cornered circuit —scientists, the general public and a mediator (a journalist)— and take a strictly one-way view on the process of spreading the knowledge of science. This model fits the lexicographical point of view: dictionaries conceive of popularization, expressed in different languages with common lexical roots, (“divulgare” in Latin, “vulgariser” in French, “popolarizzare”/ “divulgare” in Italian, “divulgar” in Spanish, “popularisieren” in German) as “publicar, extender, poner al alcance del público una cosa”^{vi}, [“to publish, spread, make something available to the general public”]; “hacer llegar a gran número de personas o del público en general algo, especialmente secreto o propio de una minoría”^{vii}[“to make known, make available to a great number of persons or to the general public something especially secret or belonging to a minority”]. As noted by Jacobi, (1987) two assertions underlie the above quoted lexicographical definitions: on the one hand, popularizing implies that science is built with a hermetic and distinct language that should be somehow decoded and, on the other hand, this type of definition suggests that a mediator is necessary, an agent knowing the original language and being able to translate it to everyday language. Within this reductionist approach, the task of popularizing science has been considered as a mere “transcodification” or translation. The task of the mediator, usually a journalist with some training in science (receiving the rather unfortunate name of “third man”

within the traditional model) was viewed as a job of translating from one specialized level of language to another, one which was accessible to the layman. This elementary model loses sight of the “intermediate stations” in the process of communicating science, when scientists themselves “reformulate” their message according to the addressee —as we will see in this article. Besides, the model does not take into account the fact that the effect of scientific communication on wider social groups can in turn affect the “original” texts produced by scientists (cf. (Lewenstein 1995; Ciapuscio 1999))^{viii}.

Some wider and more accurate conceptions have been proposed lately, views that are more adequate both descriptively and explanatorily (Jacobi 1987; Jeanneret 1994; Ciapuscio 1999). If we consider science popularization texts from the point of view of their production, it is clear that their origin is to be found in other texts: the original ones (generally working papers) are produced by researchers themselves to pose and validate their findings among the members of the scientific community. Today we should add press releases, which push news forward so that journalists make them known to the general public. In all cases, producing a science popularization text basically means recontextualizing and reformulating one’s source in such a way that it is comprehensible and relevant for a different addressee, in a discursive context which is predictable but different from that of the original source. The concept of “recontextualization” has been elaborated upon and made good use of in recent studies of professional discourse (Linell 1998; Sarangi 1998). An accurate definition of this concept is to be found in Hall, Sarangi & Slembrouck:

Recontextualization here refers, among other things, to various ways of appropriating, using, and reusing talk or text drawn from one context to make formulations available in another. However, recontextualization entails more than just the representation of speech and written text, as it presupposes another context, viz. ‘contextualization’. In this reading, (...), recontextualization amounts to putting something in a different context and, by doing so, creating a new context for it. (1999: 541).

Science popularization texts can be seen as one stage within the long and winding road to communicate science. As Weinrich (1994) holds, science is a communicative activity in itself: it exists only when it is transmitted and it becomes valid when the scientific community endorses it. The activities of communicating and transmitting science can be considered as a continuous process of recontextualization and reformulation, in which press releases or scientific articles are the initial steps and scientific news for the layman are possibly the final ones. This is why the stage of communicating science to society shows a variety of communicative forms, with alternating written and spoken modes. However, the scarce studies of science-popularization text production have focused on contrasting examples from the written source —the specialist’s paper— with the non-specialized article, neglecting intermediate texts. This focus on the extreme points of the process is probably due to the predominance, which can be appreciated quite clearly, of the traditional three-cornered model that I have already mentioned. Therefore, this type of work is focused on comparing and contrasting texts understood as *products*. Nevertheless, the production of those texts is obviously much more complex and it presents us with much more interesting data: oral (private) interviews that journalists have with scientists before writing their texts for the public. These texts offer a compact but rich overview of the communicative problems

recurring in this discursive scenario and the solutions applied by the interlocutors to solve them. The oral interview of a scientist offers a privileged area of observation for the phenomena I am interested in: the production of science popularization texts as a *process*. This becomes clear if we take into account the fact that they are oral texts but, at the same time, I should highlight that the discourse type itself is defined as an *intermediate* text in science communication, in so far as it is the basic text out of which the future text for laymen will be written.

Therefore, oral interviews could be thought of as a kind of “oral manuscript” (if I may be allowed the oxymoron) introducing a different and telling approach to the difficulties faced by those in charge of making science popular in non-specialized circles. They are particularly interesting because they present us with the scientist’s voice narrating, putting forward and explaining their own work to a journalist who will in their turn narrate, present and explain those contents again to different addressees.

The direct interview with a scientist is a common resource in Argentina, especially when what has to be communicated is related to an Argentinean scientist. In this case, the specialized journalist resorts to the private interview as the source to supplement the paper or press release. Thanks to the interview, they can familiarize themselves with aspects about which scientific works provide no clue: basic methodological issues, applications, background, as well as the circumstances surrounding the creative process involved in the making of science, which are typically left out of scientific writing.

1.2. Oral Discourse and the Formulation Level

Oral discourse studies aim not merely to elaborate general and particular organizational principles of communication, but also to identify specific problems in different forms of interaction and types of conversation. In this sense, it is relevant to state that the findings of oral discourse studies can be fruitfully used in the understanding of discourse types, a field which, perhaps for its important prospects of application in language and writing teaching, has focused on research reviewed in those writings (Adamzik 1995).

This article is precisely focused on the identification, analysis and description of the specific features of a particular discourse type: the private interview for the popularization of science, specially concerning communication difficulties typical of this type of interaction and created at the formulation level. The different degrees of competence concerning the text’s subject matter puts the participants’ mutual understanding at constant risk and thus endangers the successful development of the interaction. This is why the selection of formulation procedures, the appearance of formulation problems, and the way in which they are overcome through collaboration are relevant areas of study in the analysis of the discourse type we are interested in.

The reflections presented in this article are based on specific research on text production at the formulation level (Antos 1982; Antos and Krings 1989; Gülich and Kotschi 1995; Gülich and Kotschi 1996; Gülich 1997). In these studies, formulation is seen as a problem-solving process beginning with the attempt to overcome different kinds of obstacles usually arising in communication. Antos’s groundwork (1982) has the merit of having shifted the focus towards

the problem of “formulation” as it is understood within the framework of action theory and as communication-oriented. According to Antos, formulating means solving formulation problems and, therefore, formulation would be the result of solving problems that are manifested in a text. Formulation requires an effort, a job done by speakers, which can typically be traced in their utterances, particularly in oral ones.

I would like to point out two basic aspects which are crucial in the discursive field I work with: First, formulation proper, i.e. the procedures chosen by speakers to put knowledge forward; secondly, reformulation procedures, i.e. those by which speakers go back in their or their interlocutor’s speech and change or modify their words, producing a new (reworded) version offered as a more satisfactory one (Gülich and Kotschi 1995). Thus, reformulation procedures are defined upon criteria which are mainly structural: the structural properties defining reformulative sequences are determined by the “rewinding” process implied by rewording.

Formulation procedures can be seen as verbalization strategies selected by speakers according to their assessment of the context, goals and, naturally, interlocutor(s). Selecting and making the appropriate formulation is crucial in interactions between experts and (semi)laymen, for contents which are relatively complex and/or abstract have to be put forward so that the interlocutor can understand and process them. Formulation strategies involve all linguistic levels: lexico-syntactic structures, textual structure and organization, rhetorical and stylistic structures, and so on. In this article, I am particularly interested in certain formulation procedures which recur in expert-lay communication, are at work at the semantic-conceptual level and refer to ways of representing knowledge and putting it into words (Lakoff and Johnson 1980). I mean specifically these procedures called “illustration procedures” by E. Gülich and G. Brünner (forthcoming), Gülich’s (this volume). The authors identify four types of such strategies: several kinds of metaphorical language, different types of exemplification, scenarios and concretizations. The authors choose a broad concept of metaphor, which encompasses comparison and analogy. Exemplification includes resources deployed by speakers to explain complex concepts in terms of everyday experience. Scenario (Brünner 1987) is to be understood as a direct appeal to one’s interlocutor by creating a possible but imaginary situation to explain a complex fact. Last of all, in order to make abstract concepts concrete, speakers resort to concretizations, “procedures which consist of rewording abstract information in a non-abstract manner” (Gülich, this volume).

In my opinion, these illustration procedures are of a visibly distinct type from reformulation ones: they are strategies used to conceptualize and verbalize ideas. In other words, they are primarily defined by their semantic-conceptual nature and therefore are not necessarily confined to formulation or reformulation. On the contrary, illustration procedures can appear in both types of strategies, i.e. they can be used either as purely formulation procedures or within the framework of reformulation.

What follows is an example from the corpus that shows how the abstract concept “biochemically active” is explained through analogy using an object from the speaker’s everyday world.

Example 1 (“Angiogenesis”)^{ix}

1. C eso produce una transformación en el receptor. y esa transformación hace que el
2. C receptor ahora se vuelva bioquímicamente activo (...)El virus. en este caso logró. que
3. S este receptor MUte de tal forma de que sea como un switch de la luz que esté todo el
4. S tiempo prendido, está todo el tiempo en on. tá todo el tiempo. diciendo. a la célula
5. J m:
6. S .diciendo el tiempo activamente bioquímico, esto se llama en bioquímica y
7. S . farmacología constitutivamente activo

1. S that produces a transformation in the receptor. and that transformation makes the
2. S receptor now become biochemically active (...). In this case, the virus succeeded in
3. S getting this receptor to MUtate so that it's like a light switch which is always
4. S turned on, always on.the whole time.telling. the cell
5. J m:
6. S telling the actively biochemical time, in biochemistry and
7. S pharmacology this is called constitutively active

In this passage, the scientist (S) explains the behaviour of cellular recipients, technically described as “bioquímicamente activo” and “constitutivamente activo”, by making an overt comparison with an everyday object: a light switch (he uses the English word in the conversation in Spanish: “como un switch de la luz”). Through this comparison he links reformulation procedures one after the other, adding more words in English, such as “on”: “está todo el tiempo en on. todo el tiempo diciendo a la célula (...) diciendo el tiempo activamente bioquímico”, so that once again he arrives at the specific technical term with a denominating operation that sets the disciplinary field where the term is valid: “esto se llama en bioquímica y farmacología constitutivamente activo”.

What is the function of these illustration procedures? I can give the following provisional answer: by selecting illustration procedures, specialized speakers (experts) basically try to avoid comprehension difficulties on the part of their interlocutors. As the examples will show, experts’ utterances make clear the effort to formulate complex facts or events in a simplified manner which is closer to the layman and helps them in understanding meanings.

Unlike illustration procedures, reformulations are procedures defined mainly on structural criteria: the rewinding loop in speech, the resumption of an idea that has already been verbalized, which is linguistically realized in the two-part structure “referential expression” + “treatment expression”, both expressions usually being linked with markers. Procedures of reformulating treatment, described and characterized by Gülich and Kotschi throughout, (1987; 1995) include complex-structure phenomena: when a speaker proceeds to reformulate, they refer to an already mentioned expression with a new one that somehow changes, reformulates or expands the first one. Within this group of procedures I can mention several subtypes (paraphrasing, repetition, correction) categorized by the above-mentioned authors on the basis of the kind of marker and the semantic-pragmatic relationship established between the referential and the treatment expressions. I will now introduce a new example from my corpus:

Example 2 (“Thermal algae”)

1. S el enfoque. ya los franceses lefevre. e en sus trabajos. nos habla de. **cianoestimulinas**
2. S **es decir que hay como. estimulantes de la cicatrización de las heridas este de/de**
3. S **heridas**

1. S *the approach. the French already. lefevre. uh. in his work. talks about. cianoestimulines*
2. S *or rather there are things that sort of. stimulate healing of wounds uh of/of*
3. S *wounds*

The referential expression is “cianoestimulines”, which the speaker obviously considers opaque for his interlocutor and which he therefore reformulates. The marker “es decir” (“or rather”) clearly shows the paraphrasing procedure, and the following phrase, “that there are things that sort of. stimulate healing of wounds uh of/of // wounds”, is the treatment expression within which we can also identify a repetition strategy. Between the referential and the treatment expressions we have a relationship of semantic equivalence, encoded in the lexicon and having an etymological explanation^x, and also a relationship of difference, in so far as the treatment expression contains something new, the change in register and the adding of “wounds”.

Gülich and Kotschi (1995; 1996), as I have already said, present a typology of the different treatment procedures based on the types of markers and the relative distance between the referential and the treatment expressions. I will not be able to expand on this classification for reasons of space, but I will broadly introduce the most important differentiations of paraphrastic reformulation procedures, which I am particularly interested in. Such procedures are typically carried out because there is a source of conflict —the referential expression— that has to be overcome in order for the conversation to go on (this is the case illustrated by example 2). The prototypical realization of paraphrastic treatment procedures is the one containing the marker “that is to say”^{xi} and these strategies imply a certain degree of semantic equivalence between referential and treatment expressions. The different subtypes of paraphrases are expansion, variation and reduction. Example 2 is a case of *expansion*, because the treatment expression is longer than the referential one. *Reductions* show the obverse process: the treatment expression is shorter than the referential one (the former reduces or compresses the latter). The process is illustrated in the following example:

1. S entre los principios activos encontramos. **inhibidores. del crecimiento. microbiano**
2. S por ejemplo. no es cierto´ **es decir. es un antibiótico natural,**
J m:

1. S *among the active principles we find. microbial. growth. inhibitors*
2. S *for example. isn't that right´ I mean. it's a natural antibiotic,*
J m:

Variations, finally, do not present an expansion or reduction in treatment, but consist of presenting approximately the same expressions in a different order. I have identified an example in the sequence following the previous example:

S | **es decir. es un antibiótico natural**, o. un antiséptico natural no`

S | *I mean. it's a natural antibiotic, or. a natural antiseptic right`*

Now we may wonder in what sense these reformulating operations of previous expressions are functional or, in other words, why speakers decide to undertake such reformulations. The indisputable answer is that, by resorting to these operations, speakers solve “communicative difficulties”. Gülich and Kotschi have shown the linguistic and actional structure of these reformulative sequences in detail: the identification and marking of the problem, its treatment and solution found by speakers progressively and collaboratively. These procedures are thus regular schemata of linguistic behaviour by which speakers ensure mutual understanding. In our specific type of discourse, this explanation can be understood at first glance as the most powerful one, for the asymmetry in competence needed for the understanding of the subject matter of the text is patently reflected in the mastery of specialized vocabulary by the expert. However, our corpus shows that the function of these reformulating activities goes well beyond the layer of meaning and knowledge negotiation. It is evidente, as Apothéloz y Grossen (1995) have already asserted, that reformulations are polyfunctional and affect several discursive levels. The data I have collected suggest that their form and reach have repercussions on the actional or illocutionary level (Brandt and Rosengren 1992); they also allow me to say that those procedures are at work in the makeup of discursive identities.

2. Analysis

2.1. Global interview account

The corpus I have studied has six private conversations between specialists of several disciplines and a scientific journalist, conducted in Buenos Aires in the period 1995-1999. They have been transcribed according to the transcription conventions noted below. The journalist interviews the scientist in order to get information about their research projects which she will then reformulate into an article for laymen. They are long interviews, recordings of one hour and a half on average, where the scientist and the journalist talk about the former's object of study. The journalist is going to write a text intended for the general public, based on the knowledge gathered during the interview and supplemented with auxiliary material. Then, the specific aim of the interviews is pretty well-defined: to provide the information required to write an article that will be published in a newspaper. Evidently, the scientist has the possibility to guide the interview so as to “preform” the would-be text, a possibility that my examples will illustrate.

The examples I will discuss in this section come from two interviews I have called “Algae” (for illustration procedures, section 3.2) and “Vitamin D” (paraphrastic reformulation procedures, section 3.3), whose main characteristics are as follows:

Interview: “Thermal Algae”

Participants: A scientist (vegetable physiologist, S) and the specialized journalist (J)

Abstract: the expert and his team are carrying out some research on a specific kind of algae found in Southern Argentina (Copahue y Domuyo). These algae seem to have therapeutic effects on several skin diseases such as psoriasis.

what has been explained. In the experts' utterances the occurrence of markers asking about the interlocutors' comprehension are constant: "do you understand?", "you see?", "is it clear?", "OK?", "right?", "isn't it true?", "isn't it?" (and other question tags). These are met by the journalist with signs of ratification ("yes=yes, of course", etc.). Verbs that function as text "organizers" (Antos 1982) make the scientist's purpose explicit:

1. J. es una proteína'

2. S. & sí . el sol/el sol/e: <más rápido> **yo te explico el proceso+ después lo**

3. S. **resol/lo/lo resumimos**

4. J. & sí,

1. J. *it's a protein'*

2. S. & yes. *the sun/the sun/uh: <faster> I'll explain the process to you + then we*

3. S. *can solv/so/so we can summarize it*

4. J. & yes,

As far as the subject is concerned, the interviews are focused on the expert's field, which will become the subject of the new popularization text for laymen. This new text, as it will be exemplified by the excerpts quoted, is present throughout the interview and is in fact strategically used by the journalist in her attempt at guiding the interaction or exerting her influence upon the scientist.

In the following sections I will present the analysis of illustration and reformulation procedures. The former are examined in the interview I have called "Thermal algae"; the latter are studied in the interview "Vitamin D".

2.2. Illustration procedures in the expert-journalist interaction

In a type of communication like the one presented in this corpus, face-to-face interaction between experts and (semi)laymen, illustration procedures are a resource usually selected by experts to present the knowledge they want to convey in a way the interlocutor can understand. The illustration procedures reviewed in this article can be included in most subtypes identified by Gülich (see her paper in this volume).

How do those procedures work? Their basic function is to enhance the (semi)lay interlocutor's comprehension, given the fact that they are techniques to bring access to complex and/or abstract information closer and make it easier. Analyzed data suggest that such procedures are employed in two different ways:

a. as (pure) formulation procedures (analysis presented in section 2.2.1). The expert chooses them with the intention of avoiding communication problems during the interaction. Therefore, they select illustration procedures —basically, metaphors and concretizations— to verbalize and explain complex facts. In some other cases, the attempt is not directed at explaining the fact itself but trying to ensure the interlocutor's comprehension by presenting the information as closer to their everyday experience with the mention of objects and/or relationships typical of daily life.

b. Within the framework of reformulation procedures (analysis presented in section 2.2.2). In this case, illustration procedures are used to elaborate or “treat” a communication problem which has already arisen in the interaction or whose appearance the expert considers to be inevitable (for instance, the necessary introduction of specialized vocabulary). Within this context, illustration procedures are used to make reformulation procedures easier or to make them possible at all, either as referential expressions or as treatment ones.

Thus, I can postulate that illustration and reformulation procedures combine and overlap, in all cases with the basic goal of presenting facts, which are relatively complex in a simplified manner for the interlocutor to understand them.

2.2.1. Illustration procedures selected by experts as (pure) formulation techniques

a) To explain complex facts or events:

Example 3

- | | | |
|-----|----|--|
| 1. | J. | claro. ahora. la idea sería en un futuro sería. una vez que se determinen las |
| 2. | J. | estructuras y demás digamos fabricar algún medicamento. o sea que la gente no |
| 3. | J. | necesite ir hasta allá para tratarse sino que pueda/ |
| 4. | S. | & claro. esa sería la idea. pero ahí entonces es necesaria la/la este el trabajo del |
| 5. | S. | químico. no es cierto´ es decir. suponga que aquí encontramos una |
| 6. | S. | biomolécula equis . no es cierto. que es la predominante y que es la activa. |
| 7. | S. | porque después al probarla en forma e: singular. en forma. este. en |
| 8. | S. | profundidad.es decir. este es un producto. claro. es decir. cuando uno usted |
| 9. | S. | tiene un perfume. en el perfume hay un montón de moléculas. una es |
| 10. | S. | predominante que es la que da el=el aroma característico de ella. no es |
| 11. | J | claro |
| 12. | S. | cierto´ |
| 13. | J: | claro |
| 14. | S. | es decir. generalmente va a ir acompañada de otros productos. porque es |
| 15. | S. | es muy difícil separar. en forma pura. a menos que lo hagan en forma |
| 16. | S. | cristalizada. los químicos. entonces, una vez que saben de que este |
| 17. | S. | producto es en un noventa y ocho por ciento puro. y que es activo. ese es |
| 18. | S. | el producto. entonces el químico lo que tiene que hacer es la síntesis |
| 19. | S. | orgánica |
| 20. | J. | & claro |
| 21. | S. | & entonces sí. entonces lo vende. al comer/al=al mercado. entonces este es el |
| 22. | S. | producto |
| 23. | J. | sí= seguro |
-
- | | | |
|----|----|---|
| 1. | A. | <i>right. now. the idea would be in the future would be. once you have determined the</i> |
| 2. | A. | <i>structures and everything let's say to create some type of drug. I mean so as people don't</i> |
| 3. | A. | <i>need to go all the way there to receive treatment but they can/</i> |

4. B. & sure. that would be the idea. but then we need the/the uh. the work of a
-
5. B. chemist. isn't that right' I mean. suppose that we found here a
-
6. B. certain biomolecule X all right. which is the prevailing one and the active one.
-
7. B. because then when we try it in a uh: particular form. in a form. uh. in
-
8. B. depth. I mean. this is a product. right. I mean. when one you
-
9. B. have some perfume. in the perfume there are a bunch of molecules. one is
-
10. B. predominant which is the one that gives it its=its characteristic scent. isn't that
-
11. A. **right**
-
12. B. right'
- A. right
-
13. B. I mean. generally it will be accompanied by other products. because it's
-
14. B. it's very difficult to separate. in a pure form. unless they do it in
-
15. B. crystallized form.the chemists. then, once they know this
-
16. B. product is ninety-eight percent pure. and that it's active. that's
-
17. B. the product. then what the chemist has to do is the organic
-
18. B. synthesis
-
19. A. & right
-
20. B. & then yes. then it gets sold. to the shop/ to=to the markeplacet. then this is the
-
21. B. product
-
22. A. yes=sure

In this part of the interview, the topic is the possibility of using algae to create a medicine which maintains the algae's healing effects. To do so, the scientist has to explain how the algae's chemical structure is determined. It is necessary to find the prevailing molecule that provides the algae with their positive effects for the cure of skin diseases. The scientist begins his formulation tasks by creating a scenario in lines 5-6: "suponga que aquí encontramos una molécula equis". After several hesitations and false starts, the scientist chooses a complementary strategy —resorting to a comparison with a daily object, the perfume, in line 9. Thus, he makes an explicit comparison which is textually realized with a temporal structure: "cuando usted tiene un perfume en el perfume hay un montón de moléculas. una es la predominante que es la que da el aroma característico (...) los químicos entonces una vez que saben que este producto es en un noventa y ocho por ciento puro y que es activo. ese es el producto". Then we have the following explicit comparison:

prevailing molecule> scent> perfume
 prevailing biomolecule> organic synthesis> medicine

The comparison with an everyday object makes the understanding of the more complex phenomenon possible. The illustration procedure allows the scientist to explain how a medicine is created in a simplified version.

b) To bring specialized knowledge closer and make it more understandable:

Example 4

1. S. nosotros hemos tenido/hemos obtenido muestras [de algas, gc]. desde los casi
-
2. S. cien grados. donde prácticamente eran una masa. este. coagulada. no es cierto'
-
3. S. **de color blanco como si fuera este. clara de. huevo** porque lógico este. **son**

4. S. **son material gelatinoso** este. con contenido en proteínas

- | | |
|-------|---|
| 1. S. | <i>we've had/we've obtained samples [of algae, gc]. starting from almost one</i> |
| 2. S. | <i>hundred degrees centigrade. where they were practically a mass. a uh coagulated mass. all right'</i> |
| 3. S. | <i>white-colored as if it were uh. egg. white because it makes sense uh. they're</i> |
| 4. S. | <i>they're a gelatinous material uh. containing proteins</i> |

Here the scientist describes the algae the team have collected and analyzed. The description is rich in visual resources: “eran una masa coagulada. de color blanco”, which allows the interlocutor to picture the idea in her mind. The visual description is rounded off by resorting to a comparison with an element from daily life: “como si fuera clara de huevo (...) son material gelatinoso”. Thus, apart from conveying the specific features of the object (these algae can be found at 100 degrees and have a high component of proteins), the scientist can bring the object closer to the interlocutor’s experience with the comparison with an everyday object that makes the description easier as well as helping picture an approximation of the algae.

2.2.2. Illustration procedures included within the framework of reformulation procedures

a) To enhance procedures of introduction and treatment of technical terms:

Example 5

- | | |
|-------|---|
| 1. S. | las bacterias sí superan esas temperaturas. no´ los cien grados centígrados . las |
| 2. J. | claro. sí=sí |
| 3. S. | bacterias termales. por supuesto y también muy primitivas no´ y que |
| 4. J. | sí=sí |
| 5. S. | ahora los microbiólogos las/las han agrupado en una. este. con/ digamos |
| 6. S. | (riendo) las han metido todas en una misma bolsa + y las ponen como. |
| 7. S. | arquibacterias. es decir. bacterias primitivas no´ |
| 8. J. | a: sí=sí |

- | | |
|-------|---|
| 1. S. | <i>bacteria do survive those temperatures.don't they' one hundred degrees</i> |
| 2. J. | <i>sure. yes=yes</i> |
| 3. S. | <i>centigrade. the thermal bacteriae. of course. and also very primitive aren't they'</i> |
| 4. J. | <i>and</i> |
| | <i>yes=yes</i> |
| 5. S. | <i>now microbiologists have/have grouped them in a. uh. con/let's say<laughing></i> |
| 6. S. | <i>they've put them all together in the same bag</i> |
| 7. S. | <i>and put them like. archibacteria that is. primitive bacteria, right'</i> |
| 8. J. | <i>m: yes=yes</i> |

In this example we can see a complex formulation process operated by the expert, who tries to convey a scientific categorization of primitive bacteriae, the topic in this passage. In doing

so, he begins his formulation in line 5 with the expression “ahora los microbiólogos las/las han agrupado en una. este.” Here, he interrupts his utterance and starts searching for a more appropriate formulation. This process leaves its traces at the verbalization level: a pause, filling the pause (“este”), a false start (“con/”). Then, while laughing, he selects in line 6 a metaphorical idiom (“meter todo en la misma bolsa”, i.e. “to put everything in the same bag”), frequent in informal conversation. Afterwards, that idiom becomes the referential expression of a subsequent paraphrastic reformulation strategy to introduce the expert categorization: “y las ponen como arquibacterias”. The term “archibacteria” is the “together” or “bag” in microbiologists’ taxonomy. This expression is followed by a new paraphrastic reformulative procedure that has its origin in the term “archibacteria” and is marked by the connective “es decir”: “y las ponen como arquibacterias. es decir bacterias primitivas”. The whole process is ratified many times by the interlocutor (“yes=yes”).

In this example, it is easy to identify a complex sequence of “illustration” and “reformulation” procedures, combined in order to convey certain expert knowledge to the interlocutor in an accessible and effective manner. The illustration procedure (“meter todo en la misma bolsa”, i.e. “to put everything in the same bag”) is the starting point that constitutes a firm anchorage where the expert can communicate knowledge to the journalist by a succession of reformulating activities.

b) Illustration procedures as reformulating activities

In the example that follows, the treatment expression that modifies the previous term is built by a concretization. According to Gülich (see her contribution to this volume), concretizations are “procedures which consist of rewording abstract information in a non-abstract manner”.

Example 6

1. S.	desde el punto de vista químico. es decir. si la cosa promete. entonces es
2. S.	cuestión de que el orgánico tenga cantidad bruta como para poder hacer una
3. S.	caracterización química. es decir. una precisión. no ´este: (riendo) con
4. J.	claro
5. S.	aparatos mágicos +

1. S.	<i>from the chemical point of view. that is. if it looks promising .then it’s</i>
2. S.	<i>a question of the organic chemist having enough gross quantity so as to be able to make a</i>
3. S.	<i>chemical description. I mean. an estimation. right’. uh: <laughing> with</i>
4. J.	<i>right</i>
5. S.	<i>magical equipment +</i>

The specific concept “descripción química” is explained with a paraphrastic reformulation marked by the prototypical connective “es decir”: the treatment expression is achieved by resorting to a synonym (“precisión”) and concretization, including a humorous touch playing with the field of magic (“aparatos mágicos”). Therefore, we can see here an overlapping of

formulation and reformulation procedures that have the basic function of explaining an abstract concept with a more concrete one.

In the following example, the referential expression within the reformulation procedure is a metaphor:

Example 7

1. J.	ahora estas especies. que usted encontró acá. en el domuyo. son autóctonas de
2. J.	acá. o
3. S.	& sí=sí. genéricamente sí. (...) no es que. digamos. es la mosca blanca. no es
4. S.	cierto'
5. J.	claro,
6. S.	es decir como. para poder decir es la única alga y que produce estos
7. S.	efectos. no' pero metabólicamente tiene que haber una especie de ecotipo. de
8. S.	modificación

1. J.	<i>now these species. that you found here. in Domuyo. are they indigenous to</i>
2. J.	<i>here. or</i>
3. S.	<i>& yes=yes. generically speaking yes. (...) it's not that. let's say. it's the white fly.</i>
4. S.	<i>all right'</i>
5. J.	<i>right,</i>
6. S.	<i>that is. so as to be able to say it's the only alga and that it produces these</i>
7. S.	<i>effects. right' but metabolically there has to be some kind of ecotype. of</i>
8. S.	<i>modification</i>

The journalist asks about the indigenous origin of the algae species. In the scientist's answer we can trace the formulation process in the marks left in verbalization. The passage in bold begins with a hedge ("no es que") and is first completed with a metaphorical expression ("la mosca blanca"). This expression allows for the condensation of the appropriate answer in the form of an everyday metaphor that clearly conveys the knowledge that has to be transmitted. The metaphor is in its turn reformulated by the expert in order to ensure the meaning he wants his expression to be interpreted with: "es decir como para poder decir es la única alga y que produce estos efectos" (lines 6-7).

To summarize, let me say that our examples show that illustration procedures allow experts to put complex and abstract contents into simplified and accessible words so that the journalist can understand them. They prevent the appearance of communicative difficulties. Illustration procedures are used as pure formulation procedures or within the framework of reformulation processes, both to introduce or to carry out the explanation task.

2.3. Reformulation procedures

The ensuing analysis of examples will focus on describing how speakers deal with lexical obstacles and how functional their solutions are for discourse development. At the same time, in this part of the analysis I am interested in analyzing how the roles of specialist and layman

are clearly built by speakers during discursive activity and how intertwined relationships are established between them.

As already mentioned, the broad aim of the text the journalist is going to write—that of describing and explaining a scientific event so as to create a text for the layman— gives rise to local problems of reformulation. Specialized lexical items are the most obvious barrier in this type of interaction. In fact, the necessary insertion of terminology usually brings about a communicative problem that the speakers have to solve if the conversation is to be continued. In this section, I will first introduce examples of scientist's self-initiated reformulative sequences, which do not interrupt the global thematic development in the flow of the conversation and which I, following the traditional distinction made by Schegloff, Jefferson and Sacks (1977), have called “embedded” reformulative sequences. Then I will analyze more complex reformulative sequences, those that have been called “exposed reformulative sequences”, where there are reformulating operations begun by the journalist bearing on the structure and function of discourse. Finally, I will make some reflections on what analyzing reformulative sequences from a descriptive and functional perspective reveals about the identities of the roles built by speakers while performing these activities.

2.3.1. Embedded reformulative sequences

The specialist usually foresees the journalist's requests for clarity, and so she reformulates of her own free will what she believes can become a problem in conversation. Example 8 is a case in point:

Example 8

- | | |
|---|---|
| 1 | S. e: y esto e: se da fundamentalmente e: a nivel: de: e: <más rápido> |
| 2 | S. fundamentalmente a nivel de epidermis + o sea. de la capa superior de la piel |
| 3 | J. & sí=sí |
| | |
| 1 | <i>S: uh: and this uh: appears fundamentally uh: at the level: of: uh <faster></i> |
| 2 | <i>S: fundamentally at the level of the epidermis + in other words. the outer layer of the skin</i> |
| 3 | J. <i>yes=yes</i> |

Here we can clearly see the basic structural components of paraphrastic reformulating treatment: the referential expression (lexical obstacle: in this case, “epidermis”), the discursive marker (“in other words”) and the reformulating expression (“the outer layer of the skin”). At last, the journalist shows she has understood, as is typical in explanation sequences.

The expressions to be treated can be morphemes within word boundaries, as shown in the following example:

Example 9

- | | |
|----|---|
| 1. | S. no (es) cierto' bueno. esa e: pro. vitamina es transformada justamente por |
| 2. | S. efecto de la radiación ultravioleta a una. PREvitamina. pro y pre son este: |
| 3. | S. anterior y posterior. no' |

- 1 S. *isn't it' well. that uh: pro. vitamin is transformed precisely by*
 2 S: *the effect of ultraviolet radiation into a. PREvitamin. pro and pre mean uh:*
 3 S. *before and after. right'*

There are cases where the specialist asks whether paraphrasing is needed:

Example 10

- 1 S. o sea es por eso <rápido> que nosotros decimos que la vitamina dé y eso. por eso
 2 S. la tabla tiene dos fuentes.+ endógena y exogéna. entendés'
 3 J. sí. claro. sí=sí=sí
 4 S. endógena es. por alimentación,
 5 J. & claro
 6 S. y exogéna es por piel,
 7 J. y una puede compensar a la otra
 8 S. & puEde llegar a compensar,

- 1 S. *in other words that's why <quickly> we say that vitamin D and all that. that's why*
 2 S. *the chart has two sources. + endogenous and exogenous. understand'*
 3 J. *yes, sure; yes= yes= yes*
 4 S. *endogenous is through feeding*
 5 J. *& sure*
 6 S. *and exogenous is through the skin*
 7 J. *and one can compensate the other one*
 8 S. *& it cAN compensate*

In this example, the scientist introduces two terms, asks if paraphrasing is necessary (“¿entendés?”) and, although the other speaker says it is, she performs a treatment activity without justification (“endógena es por alimentación (...) y exógena es por piel”). This is a case that allows for the rise of objections against some characterizations of paraphrastic reformulation procedures such as the one done by Bührig (1996) according to this author, when such an operation is performed, “the listener does not have any particular knowledge, which is necessary to complete a denomination procedure and to assume the following story” (page 189, my translation)^{xiii}. In the example we can see the opposite situation: the reformulating task is not aimed at bridging a knowledge gap —the interlocutor makes it explicit that she already has that knowledge—, but is clearly motivated by other factors, which I will try to elucidate later.

2.3.2. Exposed reformulative sequences

There are examples of very complex sequences of reformulating treatment which also include requests for reformulation by one of the speakers. Example 11 is one of those:

Example 11

1	S.	bueno. ento:nces el proCEso es el sigue:nte. la radiación ultravio:ta lo que
2	S.	activa.
3	J.	sí
4	S.	lo que activa. es un metabolito. que se llama. pRO vitamina dé tres ..
5	J.	e::
6	S.	O. O. <más lento> siete dé hace cé+
7	J.	sí
8	S.	o sea siete dé hidrocolesterol. lo llamamos nosotros . no (es) cierto´
9	J.	uno
10	S.	cómo puede denominar esto de una manera: más sencilla para
11	J.	el público´
12	S.	una provitamina
13	J.	una provitamina,
14	S.	& sí
15	J.	es una proteína´
16	S.	sí,
<hr/>		
1	S.	<i>well, then the PROCess is the following. the ultravio:let radiation what it activates</i>
2	J.	<i>yes</i>
3	S.	<i>what it activates is a metabolite. which is called pROvitamin d three..</i>
4	J.	<i>m:</i>
5	S.	<i>OR. OR.. <more slowly> seven d h c</i>
6	S.	<i>in other words. seven d hydrocolesterol we call it. isn't that right´</i>
7	J.	<i>one</i>
8	S.	<i>how to say this in a way : that would be simpler for</i>
9	J.	<i>the public´</i>
10	S.	<i>a provitamin</i>
11	J.	<i>a provitamin,</i>
12	S.	<i>& yes</i>
13	J.	<i>it's a protein´</i>
14	S.	<i>yes,</i>

As we can see in this example, the specialist (S) introduces a new expression in line 4, “un metabolito”, beginning a complex reformulative sequence with five reformulating operations. First of all, the scientist paraphrases the noun phrase “un metabolito” with a metalinguistic indicator, “que se llama”, and the first reformulated option: “provitamina de tres”. In line 5, the journalist (J) unsuccessfully tries to take the turn, for in line 6 the specialist defends her turn with a marked stress in the disjunctive connector (“o. o”), and poses a second reformulation: “siete dé hace cé”. The journalist agrees in line 7 and immediately the specialist proposes a third formulation (“siete dé hidrocolesterol”), stressed by a reformulating connector, “o sea”, plus a stranded marker, “lo llamamos nosotros”. The source utterance, “un metabolito”, is reformulated three times, gaining specificity; these reformulations come in all instances from the scientist, who renders denominations that become more and more

specialized, and therefore less clear for the other speaker. In the last reformulation (line 8), she highlights the expert feature of the term and settles a sharp cut between her social group, “the experts,” represented by the exclusive “we”, and the rest, her interlocutor’s social group. It goes without saying that the different solutions suggested by the expert do not satisfy the other participant, who overtly asks for a simpler denomination for the general public (the addressee of the future text) in lines 9-11, for her interest is geared to the future science popularization text. Thus she brings about a fourth reformulation procedure; the specialist poses in line 12 a new reformulating expression, in this case layman-oriented: “una provitamina”. Still not satisfied with this solution, the journalist asks again in line 15 “¿es una proteína?”, which is finally accepted by the expert. The confirmation in line 16 closes this complex reformulative sequence at the local level, sequence in which we can notice two directions in the reformulation procedures: towards the [+expert] field, in the case of the scientist’s initial versions, and towards the [-expert] field, triggered by the journalist’s demand and interest.

The lexical problem often goes beyond the interview itself, and thus the thematization of the future science popularization text appears, very clearly in some places: the text becomes the subject matter of the conversation and the main aim of the ongoing conversational activities. Let us look at the following excerpt:

Example 12

1	S	sí. vos andá preguntándome por favor
2	J.	e: sí.. no. lo que es imporTANte' yo veo que este veinticinco hache dé o el uno
3	S.	veinticinco es importANTE. e: explicArlo en algún momEnto
4	J.	porque es lo que ustedes midieron
5	S.	exactamente
6	J.	entonces necesito e: e: .. no.. digamos no no lo puedo soslayar esto
7	S.	& claro
8	J.	de qué otra manera yo podría decir. para no. ponerme. a decir veinticinco hache
9	J.	dé
10	S.	sí
11	J.	es un metabolito'
12	S.	& el metabolito que se forma en el hígado,
13	J.	el metabolito que se forma en el hígado
14	S.	el metabolito/ el primer metabolito formado/.<dictando> el primer metabolito'
15	S.	coma. es decir. el formado en el hígado+
16	J.	& que se forma en el hígado.. y después tenemos el segundo
17	S.	& es. es el que refle:ja: el estatus de vitamina dé que tiene el organismo
18	J.	sí=sí perfecto,

1	S.	yes. go ahead and start asking questions please
2	J.	uh: yes.. no. what's imPORTant' I see that this twenty-five h d or the one
3	S.	twenty-five is imPORTANT. uh: to explAIIn it at some pOInt
4	J.	because it's what you measured
5	S.	exactly
6	J.	. then I need uh: uh: no. let's say no I can't get around this
7	S.	& sure

- 8 J. *what other way could I say. so as. not to. say twenty five h d*
-
- 9 S. *yes*
-
- 10 J. *it's a metabolite'*
-
- 11 S. *& the metabolite which forms in the liver*
-
- 12 J. *the metabolite which forms in the liver*
-
- 13 S. *the metabolite/ the first metabolite formed... <dictating> the first metabolite'*
-
- 14 S. *comma. that is. the one formed in the liver+*
-
- 15 J. *& formed in the liver.. and then we have the second one*
-
- 16 S. *& it's. it's the one which reflec:ts: the status of vitamin d in the body*
-
- 17 J. *. yes=yes perfect,*

In lines 2-4 from example 12, the journalist justifies the request for reformulation of two terms, “los metabolitos veinticinco hache dé y el uno veinticinco”: the future science popularization text will necessarily have to include these concepts (“no lo puedo soslayar esto”, the journalist says in line 6). The overall problem that the future text and its addressee (layman) pose demands another formulation: this request for reformulation is done by means of a question: “de qué otra manera yo podría decir. para no ponerme a decir veinticinco hache dé”. The journalist herself suggests a friendlier reformulation in line 11 (“¿es un metabolito?”); the scientist agrees, completes this reformulating expression and the sequence is partially closed by the journalist with the repetition of the segment (line 13). However, the expert goes on reformulating, with an overt concern for the future text. Line 14 is the beginning of a very interesting segment, for the expert takes up a teaching role, typical of a school context, and she dictates what should appear in the future text. The dictation can be perceived not only in the shift of the speed of diction, but also in the mentioning of punctuation marks (“coma”). In this reformulation there are various attempts at self-correction: “el metabolito/el primer metabolito formado/. <dictation> el primer metabolito coma. es decir el formado en el hígado”. This clearly marked shift in the kind of interaction brought about by the expert consequently settles a clearly marked hierarchical relationship between the expert and her interlocutor. The journalist, through a variation-type reformulation (“que se forma en el hígado”, in line 16) ratifies and tries to trigger the reformulative sequence for the second lexical obstacle (“y después tenemos el segundo”), which she does not succeed in doing because the specialist goes on with the reformulation of the first one (“es el que refleja el estatus de vitamina dé que tienen el organismo”). The sequence is temporarily closed with the journalist’s acceptance (line 18, “sí, sí. perfecto”).

Here is how this excerpt continues:

Example 13

- 1 J. *sí=sí=sí... y después este segu:ndo'*
-
- 2 S. *& y después pondría. <dictando> el segundo metabolito. se forma en el riñón a*
-
- 3 S. *partIR del priMero y es la forma biológicamente activa*
-
- 4 J. *& claro*
-
- 5 S. *sus efectos biológicos más importANtes son. estimula:r la entrada de calcio al*
-
- 6 J. *sí*
-
- 7 S. *organismo a través del intestIno. e:: actUAR sobre el metabolismo del huEso+*

- 8 J. sí
-
- 9 S. podés poner. porque para/porque es. es medio complicado <rie> digamos`+`
-
- 1 J. *yes= yes= yes... and then this second one`*
-
- 2 S. *& then I would write. <dictating> the second metabolite. forms in the kidney*
-
- 3 S. *STARTing from the FIRST one and is the biologically active form*
-
- 4 S. *& sure*
-
- 5 S. *its most imPORTant biological effects are. stimulating the entry of calcium into*
-
- 6 J. *yes*
-
- 7 S. *body by way of the intestine. uh:: ACTing upon the metabolism of the bOne+*
-
- 8 J. *yes,*
-
- 9 S. *you can write. because in order to/ because it's. it's a little complicated <laughing> shall we say`+`*

In example 13, the journalist still insists on the second obstacle, to her success this time (“y después este segundo”, line 1). The reformulation by the specialist is still in the dictation mode (“y después pondría”, line 2; “podés poner”, line 9) and the choice of an expository didactic discourse, which resembles school manuals. Finally, line 9 is very interesting: the specialist seems to justify this school context she has created resorting to the “a little complicated” concepts to be explained.

These examples illustrate in an overall fashion the structural and interactive aspects of the reformulating treatment sequences of the interview. The functional aspect of these sequences in the text is worth highlighting. In fact, it is necessary to ask what role(s) these reformulative sequences play in the interview. It seems clear in the text and in the reference corpus that in order to answer this question, it is necessary to make a differentiation between the embedded reformulative sequences and the exposed ones.

In the case of the former, which do not interfere with the overall thematic development (examples 8, 9 and 10) it is obvious that they have a secondary function; namely, they indirectly contribute to the comprehension of the higher illocutionary objective: ensuring the comprehension of (potential) local problems during the interview.

In the case of complex reformulating sequences (examples 11, 12 and 13), the journalist, who is thinking of her future text, explicitly asks for a reformulation; therefore, the reformulation procedures come to a foreground and become the subject matter of the conversation. They are, thus, exposed reformulative sequences. In the three cases pointed out in the examples, the overt request by the journalist allows the function of the reformulative sequences to be established: the production of the future text by means of the anticipatory solution of formulation problems. This means that these reformulative sequences transcend the text in which they are included and aim at the accurate formulation of the future science popularization text. Summarizing, these complex reformulative sequences directly assist in the achievement of the overall illocutionary purpose: providing the necessary elements to write the future text.

2.3.3. Consequences for discursive identities

Identity constitution in specialized or professional discourse has been the focus of interesting contributions recently (Barton 1996; Hamilton 1996; Matoesian 1999), especially concerning turn-taking, degree of participation of each interlocutor in the presentation of specialized topics, and so on. However, in cases that appear in our corpus, speakers resort to reformulation procedures to make up their identity. The thesis I suggest would be the following: reformulation procedures—in their form and function—are resources to construct the identities of expert and layman.

Firstly, the specialist's role: the examples have shown that the specialist performs self-initiated reformulations (examples 8, 9 and 10) and therefore foresees potential comprehension problems on the part of their interlocutor. Thus, it can be thought that she is trying to protect the journalist's image. However, in the case of example 10, where the scientist asks if a reformulation is necessary and, despite the negative answer—and ignoring it—, proceeds to its rendering, she shows little consideration for the other participant. In example 11, she reformulates of her own will several times, rendering more and more technical denominations, thus less clear for her interlocutor, and even overtly describes herself as an expert (“lo llamamos nosotros”). Examples 12 and 13 show her in a definitely hierarchical role, creating a school context, in which she dictates excerpts which resemble those from school manuals. Finally, example 13 ends with a justification for this strategy, resulting from the “a little complicated” features of the phenomena that have to be explained. All in all, the specialist positions herself as clearly superior, leaving her interlocutor in the position of she-who-doesn't-know.

The journalist resorts to a low profile, and just nods and confirms that she understands. In the case of complex reformulative sequences, she is obliged to expose herself to a considerable degree: she explicitly asks for reformulation, many a time resorting to the future addressee of the science popularization text or to the text itself as scapegoats (lines 10/11 in example 11, lines 6 and ss. in example 12). However, she also attempts at reformulating (line 15 in example 11, line 11 in example 12), a strategy which is accepted in both cases. This shows that she is trying to build a position as a specialized journalist, albeit with little success.

3. Conclusions

In this article I have identified formulation procedures of illustration and reformulation that, according to the analyzed corpus, seem to be regular and typical of this discourse type. The asymmetry in knowledge that characterizes this type of interaction makes speakers resort to formulation and reformulation strategies so as to minimize or repair potential or actual communicative difficulties. These two kinds of procedures, illustration and paraphrastic reformulation, have features of their own that allow distinctions to be made between them and to characterize them. Illustration procedures in their many forms enhance the verbalization of complex or abstract knowledge in a simplified version that the interlocutor can understand more easily. They can be used as “pure” formulation procedures or within the framework of reformulative ones. Reformulation procedures, defined mainly on structural criteria, are used to “treat” previous expressions that are supposed to be or marked as problematic during the interaction. Referential or treatment expressions of reformulative sequences can be created by means of illustration procedures in order to make explanation tasks easier or possible. In fact,

our analysis of the examples has shown that both procedures can be combined or even overlapped in their contribution to the basic goal they have to achieve: to make communication of specialized knowledge easier for interlocutors with a lesser competence in a given field of knowledge.

The study of paraphrastic reformulation procedures allows us to notice a text production procedure which is prototypical of this discursive scenario: term treatment. Overcoming lexical difficulties requires the cooperation of the interlocutors and the resorting to regular schemata which ease the formulating effort. The reformulative sequences are usually carried out in two different ways in the text: either they do not interrupt the overall thematic development, but act as local “support” to the exposition, or they become the main activity, in which case the reformulating activity itself becomes the subject matter of the conversation. The inclusion of reformulative sequences allows for hypotheses on their possible functions within the text: while in the case of non-overt sequences their effects are restricted to a particular lexical obstacle, exposed sequences are explicitly and directly related to the future science popularization text. Finally, from an interactive point of view, the reformulation initiatives, the interlocutors’ cooperation in the reformulating effort, and the strategies used to trigger and/or bring about these efforts enable us to make some reflections on how the “expert” and “non-expert” identities are positioned in the text.

On the foundation of Gülich and Kotschi’s research (1995; 1996) I have been able to deepen the understanding of formulation procedures in general and their modes in Spanish and, in particular, in the type of text I am concerned with. Thus, this paper has brought about empirical knowledge about the text type “oral interview with a scientist” and it has been intended to illustrate the richness offered by intermediate stage texts within the communication of science. The private interview with the specialist presents a magnifying-glass effect for research into the production of texts of this kind. On the one hand, we can see “on line” the recurrent problems in the transmission of science to the general public and the strategies that speakers use to overcome them. On the other hand, the way in which speakers—experts or semilaymen—analyze and solve lexical obstacles in real texts offers a privileged scenario to study the constitution of discursive identity in this kind of discourse.

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ⁱ The terms "text" and "discourse" are used as synonyms.

ⁱⁱ I will mention only some outstanding examples of linguistic studies of science popularization texts in several languages: (Loffler-Laurian 1983; Mortureux 1983; Jacobi 1984; Loffler-Laurian 1984; Mortureux 1985; Jacobi 1987; Calsamiglia 1997; Ciapuscio 1993; Gallardo 1998; Niederhauser 1999).

ⁱⁱⁱ I understand the category of "semilayman" as used by Wichter (1994) to describe an intermediate degree of competence lying somehow in between the extremes of, in his words, vertical communication, the expert and the layman, which seems to me to be more appropriate to describe the case of specialized journalists taking part in this type of interviews.

very GOOD	visible stress (depending on the power of stress, capital letters can be used for vowels, syllables or full words).
yes=yes	firm link between words.
I was told/	interruption, correction.
& of course	quick link in utterances of different speakers.
<I>, <E>	audible inhalation, exhalation.
<slowly>	linguist's comments (they begin immediately after < and are closed by +)
<imitating D>	