

French *wh*-in-situ Questions and Syntactic Optionality: Evidence from three data types¹

The aim of this paper is to corroborate the assumption of syntactic optionality for French *wh*-questions. In terms of a broader basis of evidence three different data types are utilized: Firstly, a qualitative interview approach suggests that *wh*-in-situ does not show the syntactic restrictions postulated by Bošković (1998) and Cheng & Rooryck (2000) weakening the evidence in favour of the assumption of LF-movement. Secondly, a graded grammaticality judgment test reveals even in terms of fine nuances an identical level of grammaticality between the *wh*-in-situ form and its counterpart with *wh*-movement. Given the fact that several crucial judgments in the literature on French *wh*-in-situ are doubtful, these approaches turn out to be particularly helpful for controlling undesirable interferences in the judgment process and to obtain more reliable data. Thirdly, a reading time study shows that both variants have the same cognitive complexity in processing. These empirical studies come along with methodological work concerning the development and evaluation of the instruments. From a conceptual point of view the inherent contradiction to which optionality and economy lead within the minimalist framework will be addressed. I will largely follow the suggestion of Haider & Rosengren (1998) who cast doubts on derivational economy as absolute requirement and who assume optional movement to be exploited at the interface level of syntax. Concerning the latter, particular attention will be paid to the different registers with which different French *wh*-questions correlate.

1 French *wh*-questions and the problem of optionality

A particular characteristic of French interrogative sentences consists in the number of possible word order variants. (1a, b) and (2a, b) show, for example, four different ways to construct a sentence like "Where do you go ?" (cf. Behnstedt, 1973: 209 for a more exhaustive list).

¹ I am grateful to Jürgen M. Meisel, Wolfgang Sternefeld, Marga Reis, Katrin Axel, Marie Sauvestre and particularly to Roland Meyer for in-depth discussions.

- (1a) Tu vas où ?
you go where
- (1b) Où tu vas ?
where you go ?
- (2a) Où vas-tu ?
where go you
- (2b) Où est-ce que tu vas ?
where EST-CE QUE you go

This paper will only deal with two word order variants, namely the in-situ-construction (1a) and the *wh*-extraction (1b), without additional inversion and without the element *est-ce que*.

1.1 The view of Bošković (1998) and Cheng & Rooryck (2000)

In the following, a critical discussion of two different theoretical approaches to the phenomenon of word order variants in French *wh*-questions will be presented. The first one has been proposed by Bošković (1998), the second one by Cheng & Rooryck (2000). Both analyses have in common the assumption of LF-movement, by which licensing is supposed to take place. The presumed LF-movement is based on their assumption that, by contrast to *wh*-extraction, French *wh*-in-situ obeys several syntactic restrictions and shows particular interpretational and intonational characteristics: Both analyses state (i) a restriction of *wh*-in-situ to matrix clauses and (ii) its ungrammaticality in negated structures. Cheng & Rooryck (2000) assume, in addition, that (iii) *wh*-in-situ is precluded from sentences with modals, (iv) *wh*-in-situ is precluded from sentences with quantifiers, (v) questions with *wh*-in-situ have a different interpretation from questions with overt *wh*-extraction, and (vi) *wh*-in-situ questions have a special yes/no intonation morpheme in the numeration, which is absent in questions with overt *wh*-extraction.²

² Cheng & Rooryck (2000: 11) refer to Chang (1997: 17, 19) for the assumptions (ii), (iii), (iv) and (v).

Bošković (1998) argues that the presumed restrictions (i) and (ii) follow from LF-movement, which he assumes to be more local than overt movement. Since he assumes LF-movement of a *wh*-element to be movement to an A'-head position (C), it is blocked by A'-heads C and Neg (even in the contexts in which they do not block overt *wh*-movement), but it is not blocked by A-heads V and INFL. In his framework, movement is subject to head-movement restriction. It is blocked by intervening A'-heads (such as C and Neg). French *wh*-in-situ does not have to move in overt syntax, because C with a strong +*wh*-feature is inserted at LF. This triggers LF-movement in order to check the strong +*wh*-feature. The late insertion of this C explains why *wh*-elements do not move in overt syntax.

Cheng & Rooryck (2000) propose that in situ *wh*-questions have the same intonation as yes/no-questions. They conclude that this intonation is represented by a yes/no intonation morpheme in overt syntax. This intonation Q-morpheme is inserted in the numeration and licenses *wh*-in-situ by checking the Q-feature in C⁰. Since the *wh*-element is in situ, it can obviously not check the Q-feature in C⁰ (there is no *wh*-particle either, which might have taken this function, as it is assumed for example for Chinese or Japanese, cf. Cheng, 1991).

According to Cheng & Rooryck (2000) there is no need for movement for feature-checking purposes, given that verification is ensured by the intonation morpheme. However, they suggest that this intonation Q-morpheme is underspecified in French in overt syntax. Within their approach, it can either take the value [Q: *yes/no*] or [Q: *wh*] or [Q:], the latter appears with underspecified interrogatives which they assume to be the case with *wh*-in-situ questions.

The underspecified value receives at LF the value [yes/no] as a result of a default operation. However, this would yield an illegitimate interpretation of in situ *wh*-words. Therefore, the authors argue that the underspecification of the intonation Q-morpheme is resolved for *wh*-in-situ by movement of the *wh*-feature to C⁰ at LF, where the intonation morpheme Q receives the value [*wh*].

They account for (i), the presumed restriction of *wh*-in-situ to matrix clauses, by postulating that the intonation Q-morpheme is a root morpheme, which can only appear in matrix clauses and only have matrix scope. They also derive the presumed restrictions (ii), (iii) and (iv) concerning negation, modals and quantifiers from the presence of the underspecified Q-morpheme which triggers *wh*-feature movement at LF. This feature movement at LF is supposed to be sensitive to intervention effects from the type assumed, for example, by Beck (1996a) in German multiple *wh*-questions.

These assumptions, especially assumption (vi), prompt Cheng & Rooryck (2000: 17) to the conclusion that in French, optionality is only apparent. The relevant difference is supposed to consist in the presence or absence of the yes/no intonation morpheme in the syntactic representation.

I consider this conclusion doubtful from two different points of view:

Firstly, it can be questioned whether the optionality hypothesis would have had any chance in their argumentation in the sense presented under (iii) of section 1.2.

Secondly, data obtained in an empirical field study show a different state of affairs regarding the descriptive distribution. On this ground, the presumed restrictions (i) to (vi) will be discussed one by one.

I will illustrate that *wh*-in-situ does not show the differences stated under (i) to (vi). Thus, regardless of the conceptual suggestions to be made in section 1.2, their argumentation against optionality fails to be valid from an empirical point of view. Given the data, no conclusive evidence for the assumption of LF-movement can be drawn. This analysis supports the intuitive view on *wh*-questions in French as optional variants of the same structure.

1.2 Some conceptual arguments in favour of syntactic optionality

A first observation important to the scope of the discussion concerns a certain vagueness as to the question how to define syntactic optionality and on which empirical criteria the decision in favour or against optionality should be based.

On the one hand, there are approaches in which the syntactic *representation* is in the centre of attention. The (often implicit) empirical criterion for syntactic optionality consists in the identity of the syntactic representations. Seen from this point of view, any difference in the syntactic representations, regardless of their type, falsifies the optionality hypothesis. One example for this reasoning is the assumption of Bošković (1998). He suggests a strong +*wh*-feature in overt syntax for French *wh*-extraction in contrast to French *wh*-in-situ, for which he postulates the insertion of a strong +*wh*-feature at LF.³ Another example is Cheng & Rooryck's (2000: 17) assumption of an underspecified intonation morpheme Q in the

³ One should bear in mind, that Bošković (1998) does not address explicitly the question of optionality. However, his approach has been interpreted as an implicit argumentation against optionality, as one can read in Etxepare & Uribe-Etxebarria (2000: 6): "Bošković [1998] and Cheng and Rooryck 2000 try to account for the apparent optionality in the movement of *wh*-elements in French within minimalism." This interpretation of Bošković' work may have been favoured by a certain consistency with the analysis of Cheng & Rooryck.

numeration of *wh*-in-situ constructions, which is absent in questions with *wh*-extraction. "In French, *wh*-words can undergo *wh*-movement or stay in situ. Given our analysis, optionality is only apparent. That is, it is not the case that *wh*-words optionally stay in situ or optionally undergo movement. Instead, the apparent optionality rests upon whether or not the yes/no intonation morpheme is in the numeration."

On the other hand, there are approaches in which the syntactic representation is *not* an empirical criterion for syntactic optionality. Rather, the *choice* between different word orders, the option to change or not to change the base order, constitutes a phenomenological criterion in favour of optionality.

- (3) daß ja [mehr als eine Spur]_i niemand in diesem Satz e_i suchen sollte
 that PRT more thanone trace no one in this sentence search should
 'that no one should look for more than one trace in this sentence'

Presenting an optionality analysis for scrambling, Haider & Rosengren (1998: 58) write: "In the case of Scrambling, optionality is not at stake at the level of syntactic *representation*: the gap [in (3)] is not optional. [...] Optionality of Scrambling only means that Scrambling never is the only possible constituent order."

Certain assumptions observable in the discussion are however conceptually unsatisfying:

(i) The assumption of 2 or more grammars in mind (e.g. Pollock, 1998: 191) would firstly be an inelegant theoretical model with regard to explanatory power, and secondly would imply a fairly uneconomical cognitive architecture.⁴ In his approach of "theoretical bilingualism (TB)" Roeper (1999) even explains variation of any kind by the assumption of various grammars: "Under TB, the notion of optionality can be eliminated. [...] Therefore one must postulate two grammars, even if they differ only in a single rule" (p. 170).

(ii) The assumption that places optional movement out of syntax excludes important grammatical phenomenology from theoretical attempts. Chomsky (1995b: 325) writes about phenomena like extraposition, scrambling and other "rearrangements": "They may not really belong to the system we are discussing here as we keep closely to [...] movement driven by feature checking within the $N \rightarrow \lambda$ computation". This position does however not prove that

⁴ Pollock (1998: 191) states concerning the word order variants of French *wh*-questions, that "the description of these facts will rely on an idea [...] proposing that the internal language of Francophones is not homogeneous" (own translation). He points out, that he prefers the assumption of several grammars in mind ($L1_1, L1_2 \dots L1_x$) to the assumption of syntactic optionality (conversation, Paris, September 2000).

these phenomena are out of the scope of the grammar system, but rather that they are beyond the capacity of explanation of the theory.

(iii) The assumption that identity between the syntactic representations is a necessary condition does in effect give nearly no chance to the hypothesis of optionality. The attempt to reject syntactic optionality on the basis of different syntactic representations becomes fairly trivial when at the same time differences in overt syntax are accounted for in terms of different representations.

In contrast with the preceding positions, I assume that it is useful and reasonable to have a theoretical concept which describes within a single internal language / grammar this phenomenology of word order variants. It would help to understand, on the one hand, that we can find a "direct relation" between different word order variants in the sense that a speaker has the possibility to choose, and, on the other hand, that these word order variants have different non-syntactic characteristics or functions.

The discussion of syntactic optionality raises at least at some point the issue of a semantic criterion. This issue might be better understood glancing at another linguistic sub-field with a comparable problem, namely variationist sociolinguistics. There, any attempt to express in a more precise way the intuitive definition of the linguistic variable (cf. Labov, 1963), i.e. "alternative ways to say the same thing" correlating with other (often social) factors, encounters this difficulty, as also states Winford (1996: 184): "The major problem here seems to be the lack of any clearly articulated set of principles for deciding semantic equivalence in sociolinguistic research". However, it's up to future research to propose more accurate solutions.⁵

The notion of syntactic optionality creates serious problems, inherent contradictions, within the minimalist framework and its principle of Economy of Derivation. This inconsistency does, however, not lower the whole purpose of the concept of optionality, neither does it constitute an argument against it. Chomsky (1991: 433) himself states: "Notice that this approach tends to eliminate the possibility of optionality in derivation. Choice points will be allowable only if the resulting derivations are all minimal in cost... This may well be too strong a conclusion, raising a problem for the entire approach."

⁵ Under an optionality analysis of scrambling, as proposed by Haider & Rosengren (1998), the criterion of semantic parallelism has to be weakened (or has to integrate some degree of fuzziness), since scrambling is a way (i) to disambiguate between an existentially bound interpretation and a specific or generic interpretation and (ii) to arrange scope sensitive elements according to their scope domains. Semantic parallelism could therefore not be understood as semantic identity.

A theoretical proposal made by Poole (1996) shows one attempt to clarify these inherent contradictions that allows optionality within a syntax model based on Economy of Derivation. Within his approach, optionality can only exist for those word order variants, for which the element in question is interpreted and licensed in its base position, i.e. the in situ variant must not require LF-movement for interpretation or feature-checking purposes.

Note that this assumption follows from Poole's attempt to integrate optionality and Economy of Derivation in one theoretical model and not from any inherent property of syntactic optionality itself. It would be a different situation if one did not consider derivational economy as an absolute requirement any more. This is the case in Haider & Rosengren's (1998: 86) approach: "[Optionality] may be a problem for theories which adopt an economy axiom to the extent of counting steps in a derivation. Derivational economy is a viable hypothesis, but it is far from self-evident that human grammars should embody this constraint, since there is no limiting resource to plausibly base such an economy notion on."

In the following the theoretical proposal of Poole (1996) will be presented. At the same time, I point out that it does not solve all problems and that one might prefer to conclude that the problem does not reside in the details of the principle of derivational economy but in the essence of the principle itself. Precisely the condition that movement must not take place for the purpose of feature checking and interpretation restricts considerably the possible applications of Poole's proposal.

1.3 Optionality within the Minimalist framework

The principle of Economy of Derivation (Chomsky, 1993: 32), which excludes the idea of optionality, might seem intuitively plausible for languages, where one does not find such constructions with different word order variants. It raises however a problem as soon as one encounters different possibilities of grammatical realization, as it is the case with French *wh*-questions. These phenomena suggest the optionality thesis.

Strict restrictions are imposed by the principle of derivational economy to any attempt of theoretical modification with the aim of enabling optional syntactic movement. Poole (1996) uses in an astucious manner the distinction between *Move α* , which can be applied in an iterative manner, and *Form Chain*, which creates a chain "in a single step" in order to achieve a partial integration of optionality in the theory. Poole supposes *Move α* to be cost-free, whereas he supposes *Form Chain* to be costly. He points out that this corresponds to

Chomsky's (1993: 15) view, in which *Form Chain* is considered the basic transformational operation, rather than *Move α* .

Poole further suggests that two types of movement exist: a non-chain-forming and a chain-forming movement, synonymous with optional and obligatory movement.

The first is taken to be the result of the sole application of *Move α* , hence to be cost-free, to be "reconstructed" at LF and to correspond to the operation in work in optional movement. An optional movement, i.e. an application of *Move α* without *Form Chain*, is therefore as economical as the corresponding derivation with an element in situ.

The second type of movement is supposed to be the application of both *Move α* and *Form Chain*, hence to be costly, to be interpreted at LF and to correspond to the operation at work in obligatory movement.

In addition, Poole assumes *Greed* (cf. Chomsky, 1993: 33) to be only relevant for *Form Chain*. Hence, movement operations which are not feature-checking are also possible. This is the case when *Form Chain* is not applied. In other words: Optional movement is not driven by *Greed*, i.e. they are not morphologically triggered. Poole left the question of the trigger open.

An element which undergoes *Move α* without *Form Chain* is deleted at LF, because it is non-chain-forming and, violating *Full Interpretation*, it therefore does not form a legitimate LF-object. Such a syntactic structure undergoes "LF reconstruction". After the deletion of the moved element, the (phonetically vacuous) copy in the base position is interpreted. Therefore, optional movement is semantically vacuous.

Poole (1996) states that evidence for the difference between *Move α* and *Form Chain* with regard to computational cost can be derived from the theory of successive cyclic movement.

(4) Why do you think Bill hit Barney ?

(5a) [_{CP} Why_i do [_{IP} you think [_{CP} [_{IP} Bill hit Barney *t_i*]]]]

(5b) [_{CP} Why_i do [_{IP} you think [_{CP} *t'_i* [_{IP} Bill hit Barney *t_i*]]]]

If *Move α* was the operation counted by Economy of Derivation, successive cyclic movement would be prohibited. He presents two analyses for (4). Since English *wh*-extraction is obligatory, *Form Chain* applies. Its application would cost as much in (5a) than in (5b). Therefore, any differences in computational cost would have to be caused by *Move α* .

(5a) is the result of a single application of *Move α* . This contrasts with (5b) which shows two applications of *Move α* in a successive cyclic manner. Poole argues that (5a) is, however, not a legitimate representation, because it violates the Minimal Link Condition (Chomsky, 1993, 1995a). If *Move α* was costly, (5b) should also be ruled out as a result of Economy of Derivation, since (5a), requiring fewer steps, is the more economical structure. Assuming that the most economical derivation must always be taken (4) should, according to Poole, turn out to be ungrammatical, because neither (5a) nor (5b) would be licensed.⁶ This prediction being wrong, Poole's conclusion is that (5b) must be the correct representation, which means that *Move α* must be cost-free.

1.4 The colloquial character of *wh*-in-situ questions

French is a language with relatively pronounced differences between the spoken and the written variety and between numerous speech registers. This aspect has also consequences for the methodology of the survey. *Wh*-in-situ questions in French are restricted to colloquial language (cf. Koch & Oesterreicher, 1990: 160). At the same time normative considerations are very pronounced in France coming along with an explicit knowledge about the different registers and the different stylistic values. Armstrong (2001: 133) refers to „still highly normative and formal teaching methods employed in French schools to teach the language; these methods of course promote the standard morpho-syntax of French.“ Comments like those of Doppagne (1966: 166), who qualifies most interrogative forms without inversion (apart from the *est-ce que*-construction) as “ghastly” (*horreurs*) and “plebeian forms” (*formes plébéiennes*) point up this normative aspect coming sometimes even along with social judgments.

Based on analyses of transcriptions, Koch & Oesterreicher (1990: 10/11; 82) note the following general properties of the spoken variety: (i) Spoken language has a low degree of general cognitive planning and elaboration, which also affects syntactic complexity,⁷ (ii) it requires a high degree of contextual support and cannot therefore function out of context (Koch & Oesterreicher distinguish several context types, namely situation, individual or general knowledge, linguistic context, intonation, gestures, etc.), and (iii), the distinction

⁶ The argumentation could look fairly different in OT: One could assume that a less economical candidate is the winner, if this candidate violating a presumed economy constraint does not violate at the same time a higher ranked constraint, e.g. Minimal Link Condition, violated by another, more economical candidate.

⁷ Syntactic complexity has to be understood here in a rather pre-theoretic and intuitive way.

between spoken and written language is considered as one variety dimension correlating with the three traditional synchronic variety dimensions, namely *diatopic*, *diastratic* and *diaphasic* variation (cf. Coseriu, 1969).⁸

A variational perspective points out an important characteristic of *wh*-in-situ questions in French: This construction is marked [low] on the diaphasic dimension. *Wh*-in-situ is a phenomenon restricted to the colloquial *français familier* (or to a lower register like *français populaire*) and is therefore also precluded from written language.

The aim of the present work is to study syntactic optionality using reliable grammaticality judgments (this issue will be further developed in section 3.1). Given the complexity of the grammatical phenomenon of French *wh*-in-situ, interacting with several pragmatic parameters, I opted for an empirical strategy based on methodological *triangulation* (cf. Flick, 2000). This approach consists of the use of different, complementary methods, which focus on the same phenomenon or on different aspects of the same phenomenon in order to obtain a more complete understanding of the issue. It includes the possibility to combine qualitative and quantitative research methods (cf. Kelle & Erzberger, 2000).

A qualitative interview technique was applied in order to investigate the restrictions for *wh*-in-situ postulated by Bošković (1998) and by Cheng & Rooryck (2000).

Furthermore, two quantitative, experimental methods, namely a graded grammaticality judgment test and a reading time study, were applied in order to compare graded grammaticality values as well as the cognitive processing of constructions with *wh*-in-situ and *wh*-movement.

One terminological note needs to be provided: Although there may be rare cases (e.g. long sentences with a highly recursive structure of embedding, cf. footnote 11) in which one can reasonably argue in favour of a distinction between grammaticality and acceptability, I use both concepts nearly in a synonymous way. I act on the assumption that grammaticality can be measured and that this measure corresponds, at least for the constructions I deal with in the present work, to acceptability – as long as the judgments are not distorted by interference with such extra-grammatical factors mentioned in section 2.1.

⁸ Roughly speaking, diatopic variation describes regional differences (dialects), diastratic variation describes differences with regard to the social class or group, and diaphasic variation describes different styles or registers used according to the situation.

2 French *wh*-in-situ and the issue of LF-movement

In this section I will firstly introduce the methodology of qualitative interviews and discuss then, one by one, the distributional restrictions claimed by Bošković (1998) and Cheng & Rooryck (2000), cf. (i) to (vi) in section 1.1, on the basis of new data. I will show a divergent state of affairs with regard to the descriptive distribution. Referring to data from relative clauses and from embedded questions I will show that the state of affairs remains however knotty. Nevertheless, the basis of evidence in favour of LF-movement turns out to be much weaker than suggested so far.

2.1 *A linguistic survey based on a qualitative interview*

A qualitative interview, namely the guided interview technique (cf. Flick, 1995), was carried out with 20 French native speakers, mainly students, at the university of Paris Jussieu. Their age ranged between 18 and 30 years (mean age: 24 years). The interviews lasted between 20 and 45 minutes, depending on the depth of the conversation.

Procedure:

The contact started with an instruction in which the project was presented as a research on colloquial French and the every-day linguistic behaviour of people, which aims at a better understanding of a controversy among grammarians. Most participants showed an interest for this subject, which led to a generally satisfying motivation and cooperation. They were told to rate the grammaticality of each sentence on a 7-point rating scale. They were instructed not to base their judgments on other linguistic or non-linguistic aspects (e.g. the plausibility of the described situation). In addition, they were made sensitive for echo-interpretations having to be excluded from their considerations. The interviewees were encouraged to give detailed verbal explanations for their choice. These explanations could develop to in-depth and informative conversations. The scale should mainly help them to take into account subtle nuances for their considerations and for their verbal explanations.

The asked persons should try not to base their judgments on comparisons with the *bon français*, i.e. they should try not to be influenced by prescriptive rules. Rather, they should tell, what they really said and heard in colloquial contexts. In order to help them with the abstract and unusual task of judging the grammaticality of a given construction, they were

told to imagine a private meeting with friends of the same age in a relaxed atmosphere without the presence of any person requiring the use of a higher speech register, or particular efforts of politeness. They should then judge if they could imagine to produce such a sentence (core criterion) and if they would be surprised to hear it.

The interview was guided by the order of the sentences on the questionnaire. Each sentence was read aloud by the interviewer and was embedded in an appropriate context.

Choice of the method:

The following reasons suggest that the qualitative interview is an appropriate methodological approach for investigating the issue of the presumed restrictions on French *wh*-in-situ:

(i) The *wh*-in-situ construction is an exclusively colloquial phenomenon. The interview form allows to establish a close relation between the method of survey and the characteristics of the research object. Artefacts due to the interference of spoken and written language could therefore be minimized.

(ii) Since the *wh*-in-situ construction is marked [low] on the diaphasic dimension - for some persons it is also marked [low] on the diastratic dimension - judgments are sensitive to distortions due to *social desirability*. This phenomenon has been amply discussed in empirical methodology (e.g. Edwards, 1957). In the linguistic domain, social desirability causes responses oriented on the prescriptive norm. In French, this corresponds to a speech register accepted in written language, for example *français cultivé*. The interview situation enabled the interviewer to point out in a clear and constant manner that the topic focussed on spoken language, more precisely on *français familier*. If the impression was evoked that social desirability was still influencing the responses, additional efforts were being made.⁹

(iii) Elaborated and complex expressions require in French a higher speech register. On grounds of methodological care, it is reasonable to consider for the planning of the survey a possible correlation between this general aspect of cognitive complexity and grammatical elements, like quantifiers, embedding, etc. Van Kleeck (1982) concludes that sentence length and complexity have an effect on grammaticality judgments. Schütze (1996: 164) extends this claim assuming that “any other factors that might make a sentence hard to parse” affect the judgment. Such a correlation also seemed to have motivated the following claim of one interviewee concerning the use of quantifiers in interrogatives: “If there are sentences that one

⁹ To a certain extent, the methodological challenges pointed out in (i) and (ii) can also be dealt with under standardized laboratory conditions using a thorough instruction and training (cf. section 3, cf. also footnote 23).

is not used to say, one will rather say them in a better French.”¹⁰ Though this hypothesis still requires further empirical verification and more precise formulation, the possibility of disturbing interferences with the norms of the register of *français familier* should be, however, taken into consideration. Therefore, I tried to identify possible sources of interference, which could lead to unacceptability of *wh*-in-situ questions that is not due to the ungrammaticality of the structure but to the inconsistency with the pragmatic rules of a low speech register in colloquial French.¹¹ The adopted qualitative interview approach made it possible for the interviewer to ask subsequent questions at critical or particularly sensitive moments and permitted, therefore, a higher degree of understanding which judgments of the interviewee were due to purely grammatical and which were due to pragmatic aspects.

(iv) The contextual support is crucial for some constructions under study. One should bear in mind that the context does not only consist of the adjacent sentences but of a whole situation in a broad sense. An appropriate judgment requires that the interviewee is mentally transferred in that fictive situation of communication. In this regard I refer to Bever’s claim (1970: 357): „A science of the influence of context on acceptability judgments is as necessary in linguistic research as in every other area of psychology“. Schütze (1996: 153) also pleads in favour of an appropriate context embedding: „We can reasonably expect that when subjects are asked to judge sentences in isolation, they might attempt to call up a suitable linguistic context. If we provide them with such a context instead of leaving them to their own devices, we will most likely find less variation in the resulting judgments. If we further assume that context cannot make a truly ungrammatical sentence seem acceptable (which is likely true for the vast majority of sentences), we are not biasing the outcome of the experiment by giving the sentence its best shot in this way).” In a interview situation the context can be built up in a more efficient manner compared to purely written instructions. Furthermore, section 2.3 will bring forward arguments showing that the necessary contextual support cannot be attributed to a D-Linking mechanism.

¹⁰ The original quotation reads as follows: « S’il y a des phrases qu’on n’a pas l’habitude de dire, on les dit plutôt dans un meilleur Français. »

¹¹ Discussing the phenomenon of grammaticality without acceptability, Sternefeld (1998b) points out, that complexity is an important aspect of acceptability. He argues that cognitive complexity does not only depend on syntactic complexity, e.g. the number of nested or embedded elements, but also on logical complexity. He points out that probably nobody understands immediately sentence (A) because of the accumulation of words with an (explicit or implicit) negative meaning. The recursive computation of the truth conditions reveals usually the opposite meaning to the first interpretation.

(A) I by no means wish to deny that I could not disagree with you less.

Method of analysis:

In line with the hermeneutical foundation of qualitative methodology, a primary interpretation of the data has been carried out simultaneously with the survey. This enabled a progressive orientation of the survey process to the emerging core of the theoretical problem (cf. Flick, 2000: 258). Issues identified after several interviews as obviously unproblematic, e.g. *wh-in-situ* questions in embedded *que*-sentences, were excluded from subsequent interviews. On the other hand, time and attention increased for those issues supposed to be more complex. Therefore, the number of asked persons varies between the different issues.

The results were analysed for each person based on the answer on the 7-point rating scale as well as on the verbal explanations during the conversation, which had been taken down in form of notes. The notes included also the impression of the interviewer concerning the ability of the asked person to give intuitive judgments, concerning the motivation and concerning the depth of the conversation. Both types of material, numerical and verbal, were interpreted with regard to the binary category "grammaticality" (cf. Flick, 1995: 196ff). Given that the research topic is susceptible to interferences, the verbal interview data could sometimes reveal important artefacts in the first numerical judgment and lead therefore to more appropriate interpretations.

For the overall interpretation of the study, the sample was divided into a *primary selection*, consisting of 7 persons, and a *secondary selection*, consisting of 13 persons (cf. Morse, 1994). Those interviewees were attributed to the primary selection, who showed particular capacities in focussing on the grammaticality of sentences, in imagining the appropriate context, and who showed visible efforts to reduce interferences, in order to form subtle judgments. At the same time the interviews with these persons could be carried out in a more intense way. The judgments of the primary selection had a higher weight in the interpretation of the study.¹²

2.2 *wh-in-situ* in embedded sentences

Bošković (1998) as well as Cheng & Rooryck (2000) assume that *wh-in-situ* is restricted to matrix clauses.

¹² The question to which extent results of qualitative research allow *exemplified generalization* (cf. Wahl et al., 1982: 206ff) constitutes a methodological controversy (cf. Bortz & Döring, 1995: 310ff). Certain phenomena, however, require qualitative methods, e.g. phenomena requiring in-depth interviews. In this sense, qualitative and quantitative approaches are considered as complementary.

- (6) *Jean et Pierre croient que Marie a vu qui ?
 Jean and Pierre believe that Marie has seen whom
 (according to Bošković, 1998: 46)
- (7) *Marie pense que Jean a acheté quoi ?
 Marie thinks that Jean has bought what
 (according to Cheng & Rooryck, 2000: 12)

However, we already find contrary judgments in Pollock (1998: 189), who considers (8a) and (8b) grammatical.

- (8a) Tu crois que Jean a acheté quel livre ?
 you believe that Jean has bought which book
- (8b) Tu penses que Jean va épouser qui finalement ?
 you think that Jean will marry who in the end

In order to obtain a sound empirical basis concerning this visible data mismatch, the first 5 interviewees were asked to judge (7) and (8a). They also judged (9a) and (9b).¹³

- (9a) Tu crois qu' il arrive comment ?
 you believe that he arrives how
- (9b) Tu crois que j' achète quoi ?
 you believe that I buy what

4 out of 5 persons accepted these sentences and emphasized that they often use *wh*-in-situ constructions in embedded sentences in colloquial language. 2 interviewees even claimed that in colloquial language they prefer this construction to synonymous constructions with parenthetical expressions like (10). The person, who did not accept *wh*-in-situ in embedded sentences, did obviously not adjust her judgment on *français familier*.¹⁴

¹³ (9a) was added in order to have a construction with a *wh*-adverb.

¹⁴ She suggested that she does in general not use *wh*-in-situ questions. She indicated that she prefers in general *wh*-questions with inversion. It is possible that one rarely uses *wh*-questions with inversion in spoken language (Koch & Oesterreicher, 1990: 160 exclude this possibility). However, the claim to use mainly this construction

- (10) D'après toi, il arrive comment ?
 according to you he arrives how

We can therefore claim, that, in contrast to the assumption of Bošković (1998) and Cheng & Rooryck (2000), *wh*-in-situ in embedded sentences is felicitous.

2.3 *wh*-in-situ and negation

Bošković (1998) and Cheng & Rooryck (2000) assume, that *wh*-in-situ is precluded from structures with negation. Cheng & Rooryck (2000) refer to the judgments in Chang (1997).

- (11) *Il n' a pas rencontré qui ?
 he NE has not met who
 (according to Cheng & Rooryck, 2000: 11 based on Chang, 1997: 19)

All the 20 persons were asked about the grammaticality of (11). In order to give the necessary contextual support, cf. section 1.4 (ii) and 2.1 (iv), the interviewees were told to imagine the following episode:

The non-linguistic context consists of a conversation on Jean between two friends, A and B. Jean had lived in Paris before he left for another city several years ago. He was a member of a soccer-club in Paris.

The linguistic context consists of the following utterance: A is telling B, that Jean came to Paris for a week-end, in order to meet the players of his former team. Unfortunately, he did not have enough time to see everyone.

At this point, B asks the question repeated as (12). In order to take into account the variation in *français familier* concerning the first negation element *ne*, (12) was presented with and without *ne* (here reduced to *n'*).

in spoken language and never to use the in-situ construction suggests that influence from prescriptive linguistic norms or social desirability resulted in her behaviour. Furthermore, this person belonged to the secondary selection.

- (12) Il (n') a pas rencontré qui ?
 he (NE) has not met who

In addition, 16 interviewees were asked about negated modals. (13a, b) focus on *wh*-NPs, (13c, d) focus on *wh*-adverbs. These questions were also presented in an appropriate context.

- (13a, b) Il (ne) doit pas toucher qui/quoi ?
 he (NE) must not touch who/what

- (13c, d) Il (ne) peut/doit pas aller où ?
 he (NE) can/must not go where

13 interviewees (65%) considered (12) as acceptable, 7 persons (35%) rejected this construction. (13a), (13b), (13c) and (13d) were accepted by all asked persons.

All the interviewees belonging to the primary selection (cf. section 2.1) accepted negation in *wh*-in-situ constructions. The persons, who rejected sentence (12), belonged all to the secondary selection. I therefore assume, that the rejection of (12) by a minority of persons is not due to grammatical reasons but due to critical interferences mentioned in section 2.1. Prescriptive norms might have contributed to this behaviour. If NEG caused an intervention effect at LF, it would be difficult to account for the 100% acceptance of negated modals.

Since firstly all persons accepted negation in (13a), (13b), (13c) and (13d), and secondly a majority accepted (12), and thirdly the results are unambiguous for the primary selection, I conclude that *wh*-in-situ is allowed with negation.

One crucial claim here is that the necessity of an explicit context cannot be attributed to D-linking (Pesetsky, 1987: 107/108). According to this principle *wh*-elements, which have to undergo LF-movement, can “exceptionally” be interpreted in situ. Rather I claim that a context is necessary in order to introduce previously the existential implicature typical to interrogatives in the presence of negation. This implicature draws a distinction between true *wh*-information questions and *wh*-echo-questions. In this regard, Reis (1990: 51) states, that in true *wh*-information questions there is at least one element in the search space, which closes the proposition with respect to *x*, i.e. a corresponding existential implicature with respect to *x* ($\exists xP[x]$). Therefore, by means of the utterance of such a question one commits the corresponding existence. In terms of the example (11) this is important, because “there is a *x*, he has *not* met *x*” is no default-interpretation.

In addition, Givón (1978: 95) points out that many negated *wh*-questions are unacceptable when used as true information questions and that relatively complex contexts are required, in order to interpret them as true information questions.¹⁵

(14a) ?Where didn't you leave the keys?

(14b) ?When did John not arrive?

(14c) ?How fast did John not run?

(14d) ? How did he not do it?

(14e) ? With what didn't he cut the meat?

There is a similar situation in Cheque. Meyer (2002: 168) points out that *wh*-in-situ can be used with negation, however only if a context like (15) is chosen in order to previously introduce the existential implicature of the question including the negation.

(15) [Marek je strašně roztržitý: Cokoliv mu řekneš, za deset minut si to už nepamatuje.

– 'Marek is terribly absent-minded: Whatever you tell him, he doesn't remember even after ten minutes.']

a. No to vím. Co si tentokrát zase nepamatoval?
so that know-1.SG what REFL-DAT this time again not-remembered
'I know. What hasn't he remembered this time?'

b. No to vím. A tentokrát si nepamatoval co?¹⁶
so that know-1.SG and this time REFL-DAT not-remembered what

Yet, if one still considered the grammaticality of (11) after contextual support as an instance of D-linking, one would owe an explanation to the island effect with indirect questions introduced by *si* and with relative clauses which persists even after the use of a D-linking context, as will be shown in section 2.8 (see examples (31) and (32)).

Finally, I refer to the experimental results of Featherston (2002) who shows that D-linking is not a syntactic mechanism *stricto sensu* but a general pragmatic factor improving

¹⁵ Concerning this topic, Coveney (1996: 166) states: „Negative questions are a particularly complex area, especially pragmatically, and their history in French has been the subject of considerable controversy.“

¹⁶ Meyer markiert die *wh*-in-situ, darauf sei hier hingewiesen, mit seiner vorab festgelegten fünfstufigen Skala, als leicht suboptimal, d.h. er gibt ihr nur den zweithöchsten von fünf möglichen Werten.

grammaticality:¹⁷ D-linking does not only improve the grammaticality of constructions subject to superiority, but also other control constructions. As expected by the superiority condition (16a) has a higher degree of grammaticality than (16c) in a judgment experiment. Likewise, (16d) is better than (16c) as expected by D-Linking. However, surprisingly (16b) reveals also better than (16a).

(16a) Wer hat dem Patienten WAS empfohlen? ([-]sup.viol., [-]D-Linking)
 who has to.the patient what recommended

(16b) Wer hat dem Patienten welche Zahnpasta empfohlen? ([-]sup.viol., [+]D-Linking)
 who has to.the patient which toothpaste recommended

(16c) Was hat WER dem Patienten empfohlen? ([+]sup.viol., [-]D-Linking)
 what has who to.the patient recommended

(16d) Was hat welcher Zahnarzt dem Patienten empfohlen? ([+]sup.viol., [+]D-Linking)
 what has which dentist to.the patient recommended

2.4 *wh*-in-situ and modals

Referring again to the judgments presented in Chang (1997), Cheng & Rooryck (2000) assume that modals are precluded from *wh*-in-situ constructions:

(17) *Il peut rencontrer qui ?
 he can meet who
 (according to Cheng & Rooryck, 2000: 11 based on Chang, 1997)

16 interviewees were asked about *wh*-in-situ constructions with modals. In addition to (17), (18a) and (18b) were presented. (18a, b) focus on *wh*-adverbs with modals.

¹⁷ Reinhart (1998: 38) expresses this view as follows: „I believe that D-linking, as well as many of the other instances of what is called ‚presupposition’ is a purely pragmatic notion, which is not directly encoded into the computational system.“

- (18a, b) Il peut/doit aller où ?
 he can/must go where

All the interviewees accepted *wh*-in-situ with modals, whether with *wh*-adverbs or with *wh*-NPs. This is in line with the results of (13a-d) concerning negated modals. We can therefore conclude, that modals are acceptable in *wh*-in-situ constructions.

2.5 *wh*-in-situ and quantifiers

Cheng & Rooryck (2000) assume that quantifiers are not acceptable in *wh*-in-situ constructions because they cause intervention effects on LF.¹⁸ The sentences (19), (20a) and (20b) were presented to 13 interviewees.

- (19) Plusieurs personnes ont reconnu qui ?
 several persons have recognized who

- (20a,b) Plusieurs chênes ont été coupé où/quand ?
 several oaks have been cut where/when

Necessary contextual support was given for each sentence. As already argued in 2.3, I do not consider D-linking to be a relevant factor here, but the requirement to introduce previously the existential implicature in the presence of a quantifier. The context for (19) is detailed as example. The interviewees were asked to imagine the following conversation between two friends, A and B: A is telling B about a hearing where 6 persons are accused of a kidnapping. Since all of them deny, the burden of proofs relies also on the number of witnesses. During the process, 5 of the accused were recognized by only one witness, but 1 of the accused was recognized by several witnesses. At this point person B asks (19).

11 persons (85%) accepted *wh*-in-situ constructions with quantifiers, 2 persons (15%) did not accept it. Among the 13 persons asked, 4 belonged to the primary selection. All of those accepted the *wh*-in-situ construction. I attribute the rejection by two persons to the

¹⁸ One of the examples in Cheng & Rooryck (2000: 11) based on Chang (1997), namely "Il admire toujours qui", is not a good example for a quantifier. *Toujours* is, firstly, a quantificational adverb ('always') and, secondly, often used in the sense of 'still', which is also the preferred reading for this sentence. It is interpreted as 'Who does he still admire ?' and not 'Who does he always admire ?'. This sentence, by the way, has been accepted by the interviewees.

sources of critical interferences mentioned in section 2.1. I therefore conclude, that quantifiers are allowed in *wh*-in-situ constructions.¹⁹

2.6 The intonation of *wh*-in-situ questions

The main point in the argumentation of Cheng & Rooryck (2000) against syntactic optionality consists in the assumption of a special yes/no intonation morpheme in the numeration, which they suppose to be absent in sentences with overt *wh*-movement.

Yes/no-questions in French are marked by a rising intonation, which distinguishes them from the declarative structure having the same word order, cf. (23) vs. (22). Cheng & Rooryck (2000: 4) suppose that both *wh*-in-situ questions and yes/no questions have the same rising intonation contour, which they call *yes/no intonation*, in contrast to the "nonrising intonation" of questions with *wh*-movement, which they call *wh-intonation*.

They claim, that *wh*-in-situ constructions without a rising intonation like (21) are ungrammatical.

(21) *Jean a acheté quoi ?

Jean has bought what - "nonrising intonation"

(according to Cheng & Rooryck, 2000: 4)

They further suggest that the *yes/no intonation* is represented in overt syntax as a underspecified yes/no question morpheme in C, which will be specified at LF by movement of the *wh*-feature in the way described in section 1.1.

However, the intonation contour of *wh*-in-situ questions is not identical with the contour of yes/no questions. They are also perfectly acceptable without a rising intonation at the end. Indeed, the description of Cheng & Rooryck (2000) is not consistent with various studies on the intonation of French interrogatives – for instance Delattre (1966), Autesserre & Di Cristo (1972), Fónagy & Bérard (1973), Grundstrom (1973), Boë & Contini (1975), Rossi et al. (1981), Wunderli & Braselmann (1980) und Wunderli (1982; 1983; 1984). French declaratives, e.g. (22), show a final falling intonation, suggested by the symbol “\”,

¹⁹ An open question for future empirical research remains the grammaticality status of *universal* quantifiers. According to Cheng & Rooryck (2000: 11) based on Chang (1997: 17) they are ungrammatical.

(22) *Tous les étudiants ont rencontré qui ?

all the students have met who

(according to Cheng & Rooryck and according to Chang)

contrasting with the rising intonation at the end of yes/no-questions, e.g. (23), suggested by the symbol „/“.

(22) Jean a acheté ce vase\
 Jean has bought this vase

(23) Jean a acheté ce vase/ ?
 Jean has bought this vase

The *wh*-in-situ question (21), repeated as (24), shows in contrast to the assumption of Cheng & Rooryck (2000) two different possible intonation contours at the end of the sentence. The first one (contour 1) shows a rising intonation on the last syllable, the second one (contour 2) a falling intonation.

(24) Jean a acheté quoi ?
 Jean has bought what
 contour 1: /
 contour 2: \

The crucial point is, that the intonation contour does usually not fall at the end of yes/no-questions (but see Grundstrom, 1973), whereas this is possible at the end of *wh*-in-situ questions. The rising intonation is the distinctive feature of yes/no questions. This contrasts with *wh*-in-situ constructions which have a lexically realized cue for marking the question, i.e. the *wh*-element (cf. Léon, 1992: 131). Note that echo-questions are limited to contour 1. This property distinguishes them from true information questions which are well-formed with both contours, as also points out Di Cristo (1998: 205): „EPQs [= echo partial questions] are usually characterised by an overall high pitch and by a final rise similar to that of Yes/No questions for information.“

The issue of the intonation has been studied in the scope of the qualitative interviews. 3 interviewees were asked to produce the yes/no question (23) as well as the *wh*-in-situ question (24), and to describe the intonation contour. The intonation contours were sketched on a paper during the interview, in order to help them to give more accurate verbal descriptions. They were explicitly asked about the intonation at the end of the sentence. All 3 interviewees confirmed that yes/no questions have to be pronounced with a rising intonation on the last

syllable, whereas *wh*-in-situ questions can end with a rising as well as with a falling intonation.

In addition, the intonation of *wh*-in-situ constructions with bisyllabic *wh*-elements of the '*quel* x' ('which x') - type has been investigated. 5 different interviewees were asked about the intonation of the yes/no question (23) and the *wh*-in-situ question (25a) / (25b).

(25a) Jean a acheté quel/ vase\ ?
 Jean has bought which vase

(25b) Jean a acheté quel(/) vase/ ?
 Jean has bought which vase

These results confirm the analysis of (24). All 5 interviewees asked pointed out that (23) obligatorily ends with a rising intonation, whereas the *wh*-in-situ question can either be produced with the falling contour (25a) or with the rising contour (25b). Note that echo questions cannot show the falling intonation, i.e. they are not felicitous with (25a).

These findings are in line with the results of Wunderli & Braselmann (1980) and Wunderli (1982; 1983) who showed by the means of recordings that *wh*-in-situ questions occurs with different intonation contours and that the form with rising intonation at the end is relatively rare. The assumption of an intonation morpheme in the syntactic representation of French *wh*-in-situ questions is discussed in Adli (2003b) in more detail: From the perspective of intonation phonology this idea is in principle compatible with approaches as in Rossi (1999), however, the concrete proposal of Cheng & Rooryck (2000) is abandoned, partly for the mentioned data.

I conclude that (true) *wh*-in-situ questions and yes/no questions have different intonation contours and that the assumption of a yes/no intonation morpheme made by Cheng & Rooryck (2000) is obviously not consistent with the data.

2.7 *wh*-in-situ, interpretation and context

Referring to Chang (1997), Cheng & Rooryck (2000) assume that *wh*-in-situ questions have a significant property contrasting with *wh*-movement: the "strongly presupposed context". According to Chang (1997) this notion refers to an interpretation, in which "details on an

already established (or presupposed) situation" are elicited. It is supposed to refer to a whole presupposed 'event' and not to be reducible to the notion of D-linking (Pesetsky, 1987).

Discussing the conversational fragment (26), Chang (1997) points out that the utterance of person A contains no salient element which could "fill in" the *wh*-element in the in situ question of person B. Rather, the situation of an anniversary presupposes the intention of buying presents.

(26) A: C'est l'anniversaire de Pierre la semaine prochaine.

it-is the-birthday of Pierre the week next

'It's Pierre's birthday next week.'

B: Et tu vas lui acheter quoi ?

and you will for-him buy what

'And what will you buy for him?'

Having pointed out in section 1.4 the characteristics of spoken language, it appears obvious that the "strongly presupposed context" is nothing specific to *wh*-in-situ. It can rather be concluded from the fact that *wh*-in-situ belongs to spoken language requiring a high degree of contextual support. The context of spoken language cannot be reduced to sole linguistic context but consists of all aspects in the situation of communication. Chang's (1997) notion of "strongly presupposed context" does not refer to elements which are beyond the scope of general contextualisation of spoken language.

French *wh*-in-situ questions can also be used at the very beginning of a conversation. Given a situation in which someone meets unexpectedly a friend in the street, a questions like (27) would then be nothing unusual. In a informal situation of a spontaneous question in the street it is also possible to ask a question like (28) to an unknown person. Both examples show situations of surprise, in which no "strongly presupposed context" could have been built up.

(27) Tiens, tu viens d' où ?

oh you come from where

- (28) Pardon, il est quelle heure ?
 sorry it is which hour
 ‘Sorry, what’s the time?’

In addition, questions with *wh*-movement produced in a context of spoken, colloquial language, show the same characteristics described by the notion "strongly presupposed context". Furthermore, in this connection, *wh*-in-situ questions are not more or less neutral than questions with *wh*-movement. This misinterpretation underlines the necessity of considering the characteristics of spoken language in a syntactic analysis of French *wh*-in-situ, in order not to confound pragmatic and syntactic elements.

2.8 *Wh-in-situ without LF-movement ?*

I have presented counterarguments for each of the six assumptions made by Bošković (1998) and Cheng & Rooryck (2000) and have concluded that the data does not support their views: *Wh*-in-situ does not show syntactic restrictions with embedded *que*-sentences, negation, modals and quantifiers. Without these restrictions, available evidence in favour of the assumption of LF-movement has substantially shrunk. In addition, the assumption of an intonation Q-morpheme in the numeration of *wh*-in-situ constructions, constituting a core argument of Cheng & Rooryck (2000) against optionality, does not seem convincing. Finally, we could not find the assumed differences of interpretation between *wh*-in-situ and *wh*-movement in French with respect to context presupposition.

This analysis would have another theoretical advantage. It is in line with the approach of Reinhart (1998), claiming that *wh*-in-situ is not moved at LF but interpreted in-situ using choice functions. The interpretation of questions based on choice functions goes back to Engdahl (1980). This approach has been further developed by Reinhart (1992, 1994, 1997, 1998), and reveals particularly attractive for languages with *wh*-in-situ questions. Reinhart (1998: 34) assumes that an analysis without LF-movement is more consistent with the Minimalist Program and accounts better for certain data: “It is clear that, conceptually, the analysis of *wh*-in-situ in the minimalist program is superior to previous analyses. Specifically, the syntactic evidence *against* LF-movement of *wh*-in-situ is much more compelling than the evidence for such movement.” However, one should bear in mind that within an approach that

does not rely on derivational economy, e.g. along the lines of Haider & Rosengren (1998), one would not pay the same attention to this point.

Reinhart (1998: 33) observes that subjacency violations at LF are as bad as subjacency violations in overt syntax. She further points out that *wh*-in-situ does not obey subjacency as is shown in (29a), in contrast with the syntactic movement in (29b). She rejects an explanation of this finding based on properties of LF movement, and assumes that *wh*-in-situ does not move.

(29a) Who reads the books that who writes ?

(29b) *Who do you read books that e writes ?

Reinhart (1998: 34) points out three problems, which have to be faced in a non-movement analysis: the interpretation of *wh*-in-situ, the analysis of adverbial adjuncts and the economy concept. Having regard to French *wh*-in-situ these points will be briefly addressed:

(i) Firstly, the restrictions with *wh*-adjuncts cannot be accounted for with the ECP in a non-movement analysis. Reinhart points out, that the ECP cannot be responsible for the restrictions anyway, since they do not concern *wh*-adjuncts in general but only adverbial adjuncts, as is shown by the difference between (30a) and (30b).

(30a) *Who fainted when you behaved how ?

(30b) Who fainted when you behaved what way ?

She accounts for the restrictions for adverbial adjuncts by the mechanism of interpretation of choice functions. According to her approach, choice functions have to select an individual from a set. She points out that *wh*-adverbials, in contrast to *wh*-NPs, do not have an N-set and, furthermore, they denote functions ranging over higher-order entities. "This entails that they cannot be interpreted via choice functions selecting an individual from a set (since there is neither a variable that can be bound by forming a set nor a set of individuals that the choice function could apply to)" (Reinhart, 1998: 45). This analysis is, however, not consistent with data from French *wh*-in-situ questions. *Wh*-adverbs are also allowed, as (9a), (13c), (13d), (18a), (18b), (20a) and (20b) show.²⁰ It is beyond the scope of this work to resolve this

²⁰ Furthermore, it is not understandable why *why* [how] should not be considered equivalent in meaning to *what way*, if *who* is at the same time considered equivalent in meaning to *which person* (I owe this argument to a comment of Wolfgang Sternefeld).

problem. I suggest, however, that choice functions do apply to *wh*-adverbials and that other mechanisms are responsible for the difference between (30a) and (30b).²¹

Furthermore, if one adopted Poole's (1996) approach of cost-free optional movement, one would not need to face a conceptual problem with regard to economy, as Reinhart (1998) had to do for her account of rare cases of permissible superiority violations.

Finally, the work of v. Stechow (2000) on choice functions shall be mentioned. He reformulates the *Minimal Quantified Structure Constraint* (MQSC), postulated by Beck (1996b) in order to account for the presumed LF-barriers in German, in the scope of the choice function approach. The result, called *wh*-filter, accounts for most of the German data covered by Beck's MQSC. The distributional differences presented by Beck do therefore not constitute *per se* compelling evidence in favour of LF-movement. Although I do not make use of v. Stechow's (2000) approach for the French data, his work makes in a certain sense the non-movement analysis of *wh*-in-situ generally more robust.

However, there are two cases which remain problematic without assuming LF-movement. The first one concerns the ungrammaticality of *wh*-in-situ in indirect questions introduced by *si* as in (31).

(31) *Je me demande si Jean a acheté quoi ?

Even if at the first sight it might seem that the ungrammaticality is due to the fact that the complementizer *si* does not select partial questions but yes/no-questions (cf. Pollock, 1998: 42 on the selection of declaratives and interrogatives by the complementizer in French), the question still remains open why the *wh*-in-situ element cannot take scope over the whole sentence.

The second problematic case concerns the ungrammaticality of *wh*-in-situ in relative clauses as in (32) and (33).

(32) * Jean aime le livre que qui a écrit ?

(33) * Jean aime le livre que Balzac a écrit où ?

²¹ One difference between the French data in question and the relevant English data is the opposition simple vs. multiple questions. It may constitute a promising direction for further research concerning this issue to focus on this difference.

A more thorough look reveals however that *wh*-questions are generally not felicitous in non-complement-clauses, in which only the echo-reading is admitted. *Wh*-questions are thus also ungrammatical in the adverbial sentences (34a) und (34b).

(34a) * Jean est arrivé quand Pierre a rencontré qui ?

(34b) * Jean est arrivé quand Pierre a sonné où ?

This island phenomenon with adjunct clauses is already known from simple *wh*-questions in Chinese (cf. Huang, 1982, 1995).

(35) * ni zui xihuan [weishenme mai shu de ren] ? (cf. to Huang, 1995: 154)

you most like why buy book Comp person

* “Why_i do you like [the man who bought the books *t_i*]?”

If these data were interpreted as an evidence in favour of LF-movement of *wh*-in-situ, it would nevertheless be problematic to explain why (32) is ungrammatical in French whereas the English construction (29a) is grammatical. One possible - although not entirely satisfying - solution would be to assume that in French constructions like (32) the *wh*-element cannot be interpreted in situ, whereas it is possible in English constructions like (29a). Reinhart (1998: 44ff.) had already claimed concerning the contrast between adverbial and non-adverbial *wh*-adjuncts (see above) that choice-functions could not interpret all kind of *wh*-elements in situ.

Taking into consideration this whole range of data an analysis of French *wh*-in-situ without LF-movement is at present backed by a broader ground of evidence than an analysis with LF-movement. I therefore consider *wh*-in-situ without LF-movement as the more plausible option.

3 Experimental evidence

In order to understand the phenomenon of syntactic optionality more completely and to draw the conclusions on a broader empirical basis, this work also uses two experimental methods. The strategy of this work consists in the use of various data types with their respective

theoretical meaning. Thus, the results from the qualitative interviews are complemented by graded grammaticality judgments as well as psycholinguistic reading time measurements.

Assuming that grammaticality is not a binary category but shows as well numerous nuances within the range of licensed derivations, both variants should have an identical level of grammaticality measured on a *graded* scale. In other words, if we do not find different nuances between the *wh*-in-situ construction and the *wh*-movement construction, the assumption of a "fair" choice (or competition) between optional variants is corroborated.

The same applies to the processing aspect. If the *wh*-in-situ construction and the *wh*-movement construction require identical reading times, both constructions are perfectly comparable in terms of complexity in processing.

3.1 Experiment 1: graded grammaticality judgment test

Already in section 2.1 I pointed out the importance to collect reliable and valid judgment data and I mentioned different possible sources of error. The answer to this challenge was a qualitative interview technique. In this section I present the results of a second method, a graded grammaticality judgment test, which also allows to obtain data of higher quality.

The unreliability of certain, sometimes crucial data is generally underestimated in grammar research (cf. Adli, 2003a: 32-39). Already Levelt (1974, vol. 2: 6) pointed out this problem: „It is becoming more and more apparent that decisions on very important areas of theory are dependent on very unreliable observations.” The results of section 2 can already be taken as a clear example of this phenomenon. Some cases, for example the stipulated ungrammaticality of French *wh*-in-situ with modals (cf. section 2.4), are so inconsistent with the every-day language that it is hardly understandable how such judgments can even be considered. Concerning this Sternefeld (1998a: 156) writes: „I think that generative theorizing has come in a situation, where it can no longer afford to argue for hard principles with soft data.” Bringing forward several remarkable examples from the literature on German, he points out the problem that questionable judgments are quoted by authors which are not speakers of the respective language leading thus to the constitution of myths in the international literature (cf. Birdsong, 1989, and Schütze, 1996, for examples from the literature on English).

Moreover, assumptions as the one made by Chomsky (1965: 19) are not helpful in this context and they can rather be characterized as a “no will, no way” - attitude: „Allusions to

presumably well-known ,procedures of elicitation' or ,objective methods' simply obscure the actual situation in which linguistic work must, for the present, proceed. Furthermore, there is no reason to expect that reliable operational criteria for the deeper and more important theoretical notions of linguistics (such as 'grammaticalness' and 'paraphrase') will ever be forthcoming."

Contradicting this position this study applied a test with which even fine nuances of grammaticality can be measured. It comes along with a thorough instruction and training and ensures a high level of variable control. The graded character of judgments is a matter of fact in the literature (often represented by signs like "?", "??", etc.), although it is in general not explicitly put in the centre of attention. A retrospect reveals that Chomsky (1964) had still claimed that grammaticality judgments can be mapped on a graded scale, but he gave up this concept in Chomsky (1965) in favour of a distinction between grammaticality and acceptability – intermediate levels and uncertainties were thus attributed to performance factors (see also Lakoff, 1973, and the critique in Song, 1976). The applied method centres the graded nature of judgments and aims to draw a more detailed picture of the differences between French wh-questions with and without overt movement.

Another important methodological aspect concerns the generalization of the results. It is indeed a legitimate question to ask why experimentally working scientists generally draw their conclusions after statistical inference from the sample to the population, whereas the judgment data of one individual shall be considered as a reflect of the population in grammar research. This is not due to the nature of the respective data types but rather due to non-scrutinized methodological traditions. The present sample-based study allows to take into account the deviation and the distribution of the values, and to draw statistical conclusions. In what follows, I first give a concise summary of the applied methodology, referring in this context to Adli (2003a) for full details.

78 subjects, students of the University of Toulouse 2, participated in the grammaticality judgment test, of which 65 fulfilled the validity criteria.²² All subjects were French native speakers and did not suffer from any speech impediment or serious eye defect. Linguists or

²² Two quantitative indexes (called *violation of trivial judgments*) indicate to which extent the subjects are able to carry out the test correctly. These indexes measure the amount of obviously incoherent judgments. 10 subjects showing values beyond the respective outlier limits in a stem and leaf analysis, were excluded (cf. Adli, 2003: 87-90 for full details). In addition, two persons were excluded after having assigned an extreme value to the reference sentence, in order to avoid ceiling- and floor-effects respectively. Finally, one subject was apparently, in spite of the hardest efforts of the experimenter, not able (or willing) to understand the instructions correctly and was also excluded.

students of linguistics were excluded. Each of the structures (36a) and (36b), i.e. overt *wh*-movement and *wh*-in-situ, was presented in 4 lexical variants.²³

(36a) A qui elle prête sa carte bancaire ?
to whom she lends her credit card
'Whom does she lend her credit card to?'

(36b) Elle prête sa carte bancaire à qui ?
she lends her credit card to whom
'Whom does she lend her credit card to?'

The independent variable consisted of the mean value of the judgments of the 4 lexical variants. There were as many experimental sentences as filler sentences. Each *wh*-question was presented together with one appropriate context sentence. Subjects were told not to judge the context sentence but the *wh*-question.

In order to measure *graded* grammaticality judgments, an instrument based on graphic rating was applied (cf. Guilford, 1954: 270; Taylor & Parker, 1964).²⁴ Judgments are not expressed by marking one of several boxes with a cross but by drawing a line on a bipolar scale. A theoretically infinite number of gradations are therefore possible, which, in practice, is limited by the person's differential capacity of judgment.

The judgments were given relative to a reference sentence judged in the beginning by the subject himself. A suboptimal, but not extremely ungrammatical French sentence was used as reference sentence. Both endpoints (obviously well-formed and obviously ungrammatical) were therefore given by the design to which the subject added a scale anchor, i.e. the judgment of the reference sentence. The dependent variable was the difference between the judgment of a particular sentence and the judgment of the reference sentence.

The test was presented in a A4 ring binder containing two horizontally turned A5 sheets. The reference sentence was printed on the upper, the experimental sentence on the lower A5

²³ In the experiment the *wh*-questions (36a) and (36b) were preceded by the introductory expression *Dites-moi* (=Tell me) due to methodological reasons: This expression should evoke a colloquial situation and thereby reduce interferences between the written stimuli and the colloquial register to which especially (36b) belongs (cf. section 1.4).

²⁴ Bard, Robertson & Sorace (1996) propose the magnitude estimation approach in order to measure graded grammaticality (cf. also Cowart, 1997). Magnitude estimation is usually applied when psychophysical functions are measured. These functions represent a special case in so far the distances on the scale are physically not equidistant. The comparison between psychophysical judgments and grammaticality judgments relies so far on analogy and still deserves empirical study.

sheet. On each sheet, the sentence with the graphic rating scale under it was printed in the middle. Having rated the experimental sentence on the lower sheet, the subject turned this page to go on with the next sentence. The upper sheet with the reference sentence was not turned and remained visible during the whole test. A reliability analysis revealed that the test has a satisfactory precision of measurement.²⁵

The test started with an interactive instruction and training phase of about 10 minutes. Besides a description of the method of graphic rating with self-placed anchor, two main concepts were introduced in a 9-step procedure:

Firstly, the concept of *isolated grammaticality*, necessary to reduce interferences with semantic and pragmatic effects, needed to be imparted (cf. section 2.1 for a discussion of sources of interference). Since (36a) and (36b) represent acceptable and common constructions, often used in every-day communication, their investigation does not obligatorily require a qualitative interview approach, but can also be measured under standardized laboratory conditions (cf. also footnote 9).

Secondly, the concept of *gradedness* was mediated. Subjects had to replace the common distinction between grammatical and ungrammatical, or "good" and "bad", sentences by a really graded notion of grammaticality.

They were introduced to these two main concepts, amongst other things, by rating different training sentences and by explaining their reasons for the rating to the experimenter, who could therefore adapt the instructions to the level of understanding of each subject. After instruction and training the experimenter left the room. A pre-test revealed the importance of such a training, given that the task of giving graded grammaticality judgments is usually not part of the behaviour repertory.

The hypothesis was tested at $\alpha = \beta$. This is important, because in this concrete theoretical question, I consider α and β equally important, in other words, the conclusion that

²⁵ The reliability of this graded grammaticality judgment test was measured on the basis of 11 different syntactic structures (each of which in 4 lexical variants), including marginal and ungrammatical constructions. Therefore, 11 single reliability values were calculated of which, after the necessary transformation into Fisher's Z values, the mean value was calculated and then retransformed into a r-value. The analysis revealed an overall *Cronbach's α* value of 0.85 (cf. Cronbach, 1951), an overall *Average Measure ICC* (i.e. Intra-Class Correlation) of the absolute agreement type of 0.84, and an overall *Single Measure ICC* of the absolute agreement type of 0.59 (cf. McGraw & Wong, 1996; see also Shrout & Fleiss, 1979). These reliability values show the degree of internal consistency between different lexicalisations and indicate how precisely the test can measure the dependent variable. The satisfactory *Cronbach's α* value of 0.85 indicates that the test has a good capacity to measure precisely differences and nuances. The *Average Measure ICC* of the absolute agreement type is generally a more conservative measure than *Cronbach's α* . The *Single Measure ICC* estimates the reliability which would have been expected if only one single lexical variant had been used. The difference between the *Average Measure ICC* and the *Single Measure ICC* confirms the importance of the use of various lexical variants. The mean value of the 4 lexical variants is supposed to be closer to the "true" value.

the grammaticality of two constructions is identical (i.e. a non-significant result) and the conclusion that the grammaticality of certain constructions are different (i.e. a significant result) has the same practical impact for the purposes of grammar research and should come along with the same error probability.²⁶ Unfortunately, careful consideration on statistical parameters with the objective of finding reasonable values is not prevailing in quantitative linguistics.

The hypothesis was tested with a t-test for 2 paired samples ($N_{\text{pairs}} = 65$, two-tailed) with $\alpha = \beta = 3,5\%$ and a medium effect size ($\epsilon = 0,5s$).²⁷ The results reveal the same grammaticality judgments for (36a) and (36b) ($t_{(64)} = 1.213$; $p < 0.230$), i.e. both word order variants have an identical grammaticality value on a graded scale. Given that this methodology allows to distinguish fine nuances also within the range of felicitous constructions – in statistical terms: differences of medium effect size (see Cohen, 1988: 25-27 for illustrative examples of this convention) – we can interpret this result as a further empirical indication corroborating the optionality assumption. Even at a level of subtle differences there is no preference, that is, in a certain sense the choice (or say competition) between both variants is perfectly “fair”.

3.2 Experiment 2: reading time measurement

In addition to the analysis of grammaticality the study of the processing aspect provides complementary empirical information. Studies taking into consideration judgments as well as processing data are comparatively rare (see Pechmann et al., 1994, and Bard et al., 1999, for two examples). The combination of both data types raises the question about the relationship between grammar and parser in general and about the possible evidence each data type can provide for the optionality debate in particular. In the psycholinguistic literature the question if, how and to which extent grammatical rules and processing strategies interact has been extensively discussed (cf. Farke & Felix, 1994). However, this issue is not in our focus here. Rather, the focus relies on the question as to the extent of general processing complexity of a given structure. Thus, I examine if one structural variant comes along with higher processing cost than another one. To this end, the *overall* reading times of sentences are compared. Local events in processing, e.g. possible preferences of the parser for a certain element at a

²⁶ Cf. Bortz (1999: 160), Ostmann & Wutke (1994: 705/706) and Buchner, Erdfelder & Faul (1996: 124) for further details.

²⁷ The standard deviation of the difference s is assumed to be 1.

particular sentence position, are therefore not purpose of the study. Or, to put it differently, local differences in processing not being reflected in the overall reading time (i.e. compensated across the whole sentence) are not relevant.

The issue of syntactic optionality also implies a processing aspect. It is corroborated if two variants show comparable levels of cognitive complexity in processing. One could also say that none comes along with an advantage in processing.

The hypothesis of identical complexity in processing is not trivial at all. According to one of the classic psycholinguistic assumptions from the pre-minimalist derivational grammar model, the *derivational theory of complexity* (cf. Brown & Hanlon, 1970), this should even not exist: The complexity of the parsing process is supposed to correspond to the number of syntactic transformations necessary for generating the surface structure. However, this theory in which the parser is basically conceived as a grammar “in reverse gear” can be considered as outdated since the middle of the 1970th (cf. Farke & Felix, 1994: 76).

The issue in focus here is more basic and relies on less presuppositions concerning the relationship between grammar and parser: Do syntactic movement operations come along with cognitive processing cost at all? In particular within the minimalist grammar model the question arises as to whether the economy principle has a cognitively measurable correlate. Under the assumption that overt movement operations correlate with cognitive processing cost, the *wh*-question with moved *wh*-element (36a) should have a higher cost than the *wh*-in-situ form (36b).²⁸

117 subjects, divided in 2 groups, participated in the reading time study. All subjects were students of the university of Toulouse 2, French native speakers, and did not suffer from any speech impediment or serious eye defect. Each of the structures (36a) and (36b) was presented in 8 different lexical variants. There were twice as much filler sentences than experimental sentences. 20% of the filler sentences contained nonwords. In addition, 10 warm-up sentences were presented at the initial training phase.

Each (interrogative) experimental sentence was preceded by a (declarative) context sentence. The experimental sentence was presented on a computer screen segment by segment with the *self-paced-reading* technique. The subjects controlled the presentation with two buttons of different colour: the first one was used to display the next segment, the second one

²⁸ This assumption would however be problematic if one hypothesized that both variants undergo in equal measure overt movement operations, as it would be the case under the assumption of *covert overt movement* of Uribe-Etxebarria (in press). She assumes movement of *wh*-“in-situ” in overt syntax which does not however become manifest in a change of the linear word sequence. This side-comment refers in principle to the complex relationship between theory and data in grammar research. Without a restriction to certain theoretical models such experimental studies would often not been conceivable.

had to be obligatorily pressed when a nonword appeared. This procedure should ensure the cognitive processing of each segment. Having read the experimental sentence, three possible answers to the question appeared, of which the correct one had to be chosen. Relevant for the analysis was only the reading time of the (correctly answered) experimental sentence. Subjects were instructed to read quickly but accurately and to try to avoid any mistakes. The training session took place in presence of the experimenter, who could answer any remaining questions. The person was alone in the laboratory during the experimental phase.

Participants with extremely high error rates in the distinction between words and nonwords, extremely high error rates in the answer of the question, or extremely slow reading times ($x + 3$ standard deviations, cf. Ratcliff (1993) for a discussion) were excluded. On account of these exclusion criteria 10 subjects were not considered in the analysis.

For the same reasons as already mentioned in the context of the grammaticality judgment test the methodology of $\alpha = \beta$ was applied. Furthermore, the test should be able to detect a medium effect size ($\varepsilon = 0,5s$). Given a sample size of $n_1=56$ und $n_2=51$ fair hypothesis testing at $\alpha = \beta = 14\%$ was realized. Concerning these statistical parameters it shall be mentioned that the great majority of the sentence processing studies I know were analysed with greater effect size values, sometimes with extremely big effect sizes (and/or extremely small statistical power $1-\beta$). In these works real differences of medium effect size remained undetected. This is not a reasonable strategy, because there is no reason to assume that in language processing relevant phenomena do *not* have the size of medium effects. In addition, in these studies the α -value is usually set to 5% which is exactly the wrong strategy to adopt with small samples, since it only aggravates the problem of effect size and/or statistical power.²⁹

The analysis was carried out with a t-test for 2 independent samples. The results reveal identical reading times for (36a) and (36b) ($t_{(105)} = 0.583$; $p < 0.561$). The *wh*-in-situ construction and the *wh*-movement construction require the same amount of processing cost. From a processing perspective, no word order variant is at disadvantage, which corroborates the optionality hypothesis. At a more general level this result also indicates that syntactic movement does not correlate *per se* with cognitive cost in processing. One can dare the conclusion that the economy principle of the minimalist grammar model cannot be legitimated with general cognitive principles (which does not mean that it is not legitimate as a *theory-internal* concept).

²⁹ See also the law of small numbers described by Tversky & Kahnemann (1971).

One might however object that the results interfere with another source of complexity: During the reading of a *wh*-in-situ construction there is a temporal ambiguity between a yes/no-question and a *wh*-question which is only solved when the *wh*-word is encountered, whereas the concrete interrogative type of the variant with overt *wh*-movement is manifest from the beginning. With other words, one could object that the identity of reading times has to be attributed to the fact that the temporary ambiguity with respect to the interrogative type makes the processing of the *wh*-in-situ structure more complex (e.g. for the need to prepare in parallel to possible interpretations) and that, thereby, a really existing complexity effect due to *wh*-movement cannot come to the fore. However, the results presented in Adli (2003a: 146) rebut such an objection by virtue of a reading time experiment on French object questions, with and without stylistic inversion, which exhibit identical reading times, too.

(37a) quelle est l'armoire que **refont** les employés de la scierie ?
 which is the cabinet that restore the employees of the workshop
 'which cabinet do the workshop's employees restore?'

(37b) quelle est l'armoire que les employés de la scierie **refont** ?
 which is the cabinet that the employees of the workshop restore
 'which cabinet do the workshop's employees restore?'

In (37a) stylistic inversion changed the order of the lexical subject-DP and the verb contrasting with the canonical S-V-sequence in (37b) (cf. Kayne, 1972). The point is, that *both* sentences start with the presentation of the *wh*-element. In other words, at no moment there is a ambiguity between *wh*-question and yes/no-question. This result confirms that overt syntactic movement does indeed not have an effect on cognitive complexity in processing.

Assuming that syntactic optionality also has a cognitive aspect, this finding of a (cognitively) cost-free movement constitutes an argument in favour of the comparability of both variants in terms of complexity and thus constitutes a further piece of empirical evidence in favour of the concept of optionality.³⁰

³⁰ One might also extend this interpretation and draw a parallel to Poole's (1996) assumption of cost-free optional movement.

4 Conclusion

Section 1.2 addressed the problem of the inherent contradiction to which the concept of optional syntactic movement leads in the economy-based minimalist model. Section 1.3 described the proposal of Poole (1996) to integrate the possibility of cost-free movement into the framework. Then, section 2.8 presented the approach of Reinhart (1998) which dispenses also with semantic reasons for LF-movement. The *wh*-filter of von Stechow (2000) even could constitute a mean to hedge one's bets with respect to new data supporting intervention effects or the like. One can go in this way adding new options to the argumentation, it will remain, nevertheless, problematic. At latest, the issue of the trigger of optional movement remains open. This raises the question as to whether it is really promising to maintain on the one hand derivational economy as absolute requirement and to annul it like Poole (1996) astuciously or to elude assuming various, parallel grammar systems in the cognitive system. I therefore subscribe to the view of Haider & Rosengren (1998: 6) who do not consider a syntactic trigger necessary in their optionality analysis for scrambling in German: „Scrambling is truly optional: irrespective of the syntactic character of Scrambling, there is no syntactic trigger. It is blindly and optionally generated in syntax, wherever syntax permits, and exploited at the interface levels of syntax. Scrambling, thus, is a syntactic device with more than one non-syntactic (semantic and pragmatic) function.” Section 1.4 addressed the differences in register between various French *wh*-questions (see also Coveney, 1996; Armstrong, 2001). In order to characterize accurately the speech register, I regard as useful to conceive the diaphasic axis as a continuous, bipolar scale, i.e. a particular register can be mapped somewhere on this continuum between the two poles [- diaphasic] and [+ diaphasic]. The very colloquial *wh*-in-situ construction (36b) has a lower value on this axis than the form (36a).³¹ These grammatical variants are also stylistic variants. The stylistic shift resulting from optional movement in French *wh*-questions constitutes the non-syntactic function exploited at the interface levels of syntax, namely at a pragmatic level.³² These stylistic differences also correlate with social differences. Coveney (1996: 234) analyses a corpus of spontaneous speech data and finds effects of age and social class on the frequency of *wh*-

³¹ Within such a description, the stylistic richness of French interrogative syntax can be more accurately expressed. Contrasting with (36b), the form with *est-ce que* (2b) or with inversion (2a) would have a higher value than (36a).

³² *Wh*-questions do not constitute the only phenomenon in French with stylistically distinct word order variants. The same is true for stylistic inversion: The inverted word order is stylistically more elevated than the canonical word order, cf. (37a) vs. (37b).

constructions like (36a) and (36b). Adli (2003a) shows statistically significant social effects on graded grammaticality judgments for these *wh*-questions. In addition, these effects reveal particularly salient in the case of *wh*-questions, compared to several other structures.

We can summarize that the empirical results from three different data types support the concept of syntactic optionality for French *wh*-questions: Firstly, the qualitative interviews uncovered considerably weaker evidence in favour of the assumption of LF-movement than has been claimed in some previous contributions. Secondly, a graded grammaticality judgment test revealed even in terms of fine nuances an identical level of grammaticality. Thirdly, a reading-time experiment showed that both variants have the same cognitive complexity in processing. Even though there is no *experimentum crucis*, each of these results adds one piece of evidence to the optionality assumption. A rehabilitation of this concept would allow to better account for an important phenomenology in French *wh*-syntax for which otherwise the grammar model would remain blind.

5 References

- Adli, Aria (2003a). *Grammatische Variation und Sozialstruktur: eine empirische Untersuchung anhand von Interrogativstrukturen des Französischen*. PhD dissertation, University of Tübingen.
- Adli, Aria (2003b). Y a-t-il des morphèmes intonatifs impliqués dans la syntaxe interrogative du français? Le cas du *qu*-in-situ. To appear in: Meisenburg, Trudel & Maria Selig (eds.). *Nouveaux départs en phonologie: les conceptions sub- et suprasegmentales*. Tübingen: Narr.
- Armstrong, Nigel (2001). *Social and Stylistic Variation in Spoken French: a Comparative Approach*. Amsterdam, Philadelphia: John Benjamins.
- Autesserre, Denis & Albert Di Cristo (1972). Recherches psychosémantiques sur l'intonation de la phrase française. *TIPA*, 1: 61-98.
- Bard, Ellen Gurman, Cheryl Frenck-Mestre, Louise Kelly, Kerry Killborn & Antonella Sorace (1999). *Judgement and Perception of Gradable Linguistic Anomaly*. Ms., Human Communication Research Centre, University of Edinburgh.
- Bard, Ellen Gurman, Dan Robertson & Antonella Sorace (1996). Magnitude Estimation of Linguistic Acceptability. *Language*, 72 (1): 32-68.

- Beck, Sigrid (1996a) Quantified structures as barriers for LF movement. *Natural Language Semantics*, 4: 1-56.
- Beck, Sigrid (1996b) *Wh-Construction and Transparent Logical Form*. PhD thesis, University of Tübingen.
- Behnstedt, Peter (1973) *Viens-tu? Est-ce que tu viens? Tu viens ? Formen und Strukturen des direkten Fragesatzes im Französischen*. Tübingen: Narr.
- Boë, Louis-Jean & Michel Contini (1975). Etude de la phrase interrogative en français. *Bulletin de l'Institut de Phonétique de Grenoble*, 4: 85-102.
- Bortz, Jürgen & Nicola Döring (1995) *Forschungsmethoden und Evaluation für Sozialwissenschaftler*. Berlin, Heidelberg: Springer.
- Bortz, Jürgen (1999) *Statistik für Sozialwissenschaftler*. Springer: Berlin, Heidelberg.
- Bošković, Željko (1998). LF movement and the Minimalist Program. In: Tmanji, Pius N. & Kiyomi Kusumoto (eds.). *Proceedings of NELS 28*. Amherst (Mass.): GLSA.
- Brown, R. & Hanlon, C. (1970). Derivational complexity and order of acquisition in child speech. In: Hayes, J.R. (eds.). *Cognition and the development of Language*. New York: Wiley.
- Buchner, Axel, Edgar Erdfelder & Franz Faul (1996). Teststärkeanalysen. In: Erdfelder, Edgar, Rainer Mausfeld, Thorsten Meiser & Georg Rudinger (eds.) *Handbuch quantitative Methoden*. Weinheim: Beltz, Psychologie Verlags Union.
- Chang, Lisa (1997) *Wh-in-situ phenomena in French*. Master's thesis. University of British Columbia.
- Cheng, Lisa Lai-Shen & Johan Rooryck (2000). Licensing Wh-in-situ. *Syntax*, 3: 1-19.
- Cheng, Lisa Lai-Shen (1991). *On the typology of wh-questions*. PhD thesis, MIT.
- Chomsky, Noam (1964). *Current Issues in Linguistic Theory*. Den Haag: Mouton.
- Chomsky, Noam (1965). *Aspects of the Theory of Syntax*. Cambridge (Mass.): MIT Press.
- Chomsky, Noam (1991). Some notes on economy of derivation and representation. In: Freidin, Robert (eds.). *Principles and Parameters in Comparative Grammar*. Cambridge (Mass.): MIT Press.
- Chomsky, Noam (1993). A minimalist program for linguistic theory. In: Hale, Kenneth & Samuel Jay Keyser (eds.) *The view from Building 20: Essays in linguistics in honor of Sylvain Bromberger*. Cambridge (Mass.): MIT Press.
- Chomsky, Noam (1995a) Bare Phrase Structure. In: Webelhuth, G. (ed.) *Government and Binding Theory and the Minimalist Program*. Oxford: Basil Blackwell.
- Chomsky, Noam (1995b) *The Minimalist Program*. Cambridge, Mass.: MIT Press.

- Cohen, Jacob (1988). *Statistical power analysis for the behavioral sciences* (2nd edition). Hillsdale: Erlbaum.
- Coseriu, Eugenio (1969) Einführung in die strukturelle Linguistik. University of Tübingen.
- Coveney, Aidan B. (1996). *Variability in Spoken French. A Sociolinguistic Study of Interrogation and Negation*. Exeter: Elm Bank.
- Cowart, Wayne (1997). *Experimental Syntax. Applying Objective Methods to Sentence Judgments*. London: Sage Publications.
- Cronbach, Lee J. (1951). Coefficient alpha and the internal structure of tests. In: *Psychometrika*, 16(3): 297-334.
- Delattre, Pierre (1966). Les dix intonations de base du français. *French Review*, 40(1): 1-14.
- Di Cristo, Albert (1998). Intonation in French. In: Hirst, Daniel & Albert Di Cristo (eds.). *Intonation Systems. A Survey of Twenty Languages*. Cambridge: Cambridge University Press.
- Doppagne, Albert (1966). *Trois aspects du français contemporain*. Paris: Larousse.
- Edwards, Allen L. (1957). *The Social Desirability Variable in Personality Assessment and Research*. New York: Holt, Rinehart and Winston.
- Engdahl, Elisabeth (1980) *The Syntax and Semantics of Question in Swedish*. PhD thesis, University of Massachusetts.
- Etxepare, Ricardo & Myriam Uribe-Etxebarria (2000) *Focus and scope at the right edge in Spanish*. handout of a talk presented at Going Romance 2000, Utrecht.
- Farke, Hildegard & Sascha W. Felix (1994). Subjekt-Objektasymmetrien in der Sprachverarbeitung - Spurensuche. In: Felix, Sascha W., Christopher Habel & Gert Rickheit (eds.). *Kognitive Linguistik - Repräsentationen und Prozesse*. Opladen: Westdeutscher Verlag.
- Featherston, Sam (2002). Magnitude estimation and what it can do for your syntax: Some wh-constraints in German. To appear in: *Lingua* (special issue ed. by Robert Borsley).
- Flick, Uwe (1995) *Qualitative Forschung: Theorien, Methoden, Anwendung in Psychologie und Sozialwissenschaften*. Reinbek: Rowohlt.
- Flick, Uwe (2000) Triangulation in der qualitativen Forschung. In: Flick, Uwe, Ernst v. Kardoff & Ines Steinke (eds.) *Qualitative Forschung: Ein Handbuch*. Reinbek: Rowohlt.
- Fónagy, Ivan & Eva Bérard (1973). Questions totales simples et implicatives en français parisien. In: Grundstrom, Allan & Pierre Léon (eds.). *Interrogation et Intonation*. Paris: Didier. (= *Studia Phonetica*, 8).

- Fox, Dany (1994). *Quantifier Scope in VP Ellipsis*. Ms., MIT, Cambridge.
- Givón, Talmy (1978). Negation in Language: Pragmatics, Function, Ontology. In: Cole, Peter (eds.). *Syntax and Semantics*, 9: 69-112. New York, Academic Press.
- Grundstrom, Allan (1973). L'intonation des questions en français standard. In: Grundstrom, Allan & Pierre Léon (eds.). *Interrogation et Intonation*. Paris: Didier. (= *Studia Phonetica*, 8).
- Guilford, Joy P. (1954). *Psychometric methods*. New York: MacGraw-Hill.
- Haider, Hubert & Rosengren, Inger (1998) Scrambling. *Sprache und Pragmatik*.
- Huang, C.-T. James (1982). Logical Relations in Chinese and the Theory of Grammar. PhD dissertation, MIT.
- Huang, C.-T. James (1995). Logical Form. In: Webelhuth, Gert (eds.). *Government and Binding Theory and the Minimalist Program*. Oxford: Blackwell. p. 125–176.
- Kayne, Richard S. (1972). Subject inversion in French interrogatives. In: Casagrande, Jean & Bohdan Saciuk (eds.). *Generative Studies in Romance Languages*. Rowley (Mass.): Newbury House.
- Kelle, Udo & Christian Erzberger (2000). Qualitative und quantitative Methoden: kein Gegensatz. In: Flick, Uwe, Ernst v. Kardoff & Ines Steinke (eds.). *Qualitative Forschung: Ein Handbuch*. Reinbek: Rowohlt.
- Kleeck van, Anne (1982) The emergence of linguistic awareness: a cognitive framework. *Merrill-Palmer Quarterly*, 28(2): 237-265.
- Koch, Peter & Oesterreicher, Wulf (1990) *Gesprochene Sprache in der Romania: Französisch, Italienisch, Spanisch*. Tübingen: Niemeyer.
- Labov, William (1963). The social motivation of a sound change. *Word* 19: 273-309.
- Lakoff, George (1973). Fuzzy grammar and the performance/competence terminology game. In: Corum, Claudia, T. Cedric Smith-Stark & Ann Weiser (Hrsg.). *Papers from the Ninth Regional Meeting, CLS 9*. Chicago: Chicago Linguistics Society.
- Léon, Pierre (1992). *Phonétisme et prononciation du français*. Paris: Nathan.
- McGraw, Kenneth O. & Wong, S.P. (1996). Forming inferences about some intraclass correlation coefficients. *Psychological Methods*, 1(1): 30-46.
- Meyer, Roland (2002). *Zur Syntax der Ergänzungsfrage in einigen slavischen Sprachen: Empirische Untersuchungen am Russischen, Polnischen und Tschechischen*. PhD dissertation, University of Tübingen.

- Morse, Janice M. (1994). Designing Funded Qualitative Research. In: Denzin, Norman & Yvonna S. Lincoln (eds.). *Handbook of Qualitative Research*. p. 220-235. London: Sage.
- Ostmann, Axel & Joachim Wutke (1994) Statistische Entscheidung. In: Herrmann, Theo & Werner H. Tack (eds.). *Methodische Grundlagen der Psychologie - Enzyklopädie der Psychologie, Themenbereich B Methodologie und Methoden, Serie I Forschungsmethoden der Psychologie*. Vol 1. Göttingen, Bern, Toronto, Seattle: Hogrefe.
- Pechmann, Thomas, Hans Uszkoreit, Johannes Engelkamp & Dieter Zerbst (1994). Word order in the German middle field: linguistic theory and psycholinguistic evidence. *CLAUS Report 43*, Department of Computational Linguistics, Saarland University.
- Pesetsky, David (1987). *Wh-in-situ: movement and unselective binding*. In: Reuland, Eric & Alice ter Meulen (Hrsg.) *Representation of (in)definiteness*. p. 98-129. Cambridge (Mass.): MIT Press.
- Pollock, Jean-Yves (1998) *Langage et Cognition: Introduction au programme minimaliste de la grammaire générative*. Paris: Presses Universitaires de France.
- Poole, Geoffrey (1996). Optional Movement in the Minimalist Program. In: Abraham, Werner, Samuel D. Epstein, Hoskuldur Thrainsson, C. Jan-Wouter Zwart (Hrsg.). *Minimal Ideas. Syntactic studies in the minimalist framework*. p. 199-216. Amsterdam: Benjamins.
- Ratcliff, Roger (1993) Methods for Dealing with Reaction Time Outliers. *Psychological Bulletin*, 114(3): 510-532.
- Reinhart, Tanya (1992). *Wh-in-situ: an apparent paradox*. In: Dekker, Paul & Martin Stokhof (eds.) *Proceedings of the Eight Amsterdam Colloquium*. p. 483-491. Institute for Logic, Language and Computation (ILLC), Universiteit van Amsterdam.
- Reinhart, Tanya (1994) *Wh-in-situ: in the Framework of the Minimalist Program*. *OTS Working Papers*. University of Utrecht.
- Reinhart, Tanya (1997) Quantifier Scope: How Labor is Divided Between QR and Choice Functions. *Linguistics and Philosophy*, 20: 335-397.
- Reinhart, Tanya (1998) *Wh-in-situ in the framework of the Minimalist Program*. *Natural Language Semantics*, 6: 29-56.
- Reis, Marga (1990). Zur Grammatik und Pragmatik von Echo-w-Fragen. *Sprache und Pragmatik*, 20: 1-72.

- Roeper, Thomas (1999). Universal Bilingualism. *Bilingualism: Language and Cognition*, 2(3): 169-186.
- Rossi, Mario, Albert Di Cristo, Daniel Hirst, Philippe Martin & Yukihiro Nishinuma (1981). *L'intonation: de l'Acoustique à la Sémantique*. Paris: Klincksieck.
- Schütze, Carson T. (1996) *The Empirical Base of Linguistics: Grammaticality Judgments and Linguistic Methodology*. Chicago, London: The University of Chicago Press.
- Shrout, Patrick E. & Joseph L. Fleiss. (1979). Intraclass correlations: uses in assessing rater reliability. *Psychological Bulletin*, 86: 420-428.
- Song, Seok Choong (1976). Confessions of an ordinary working grammarian. In: *Problems in Linguistic Metatheory: Proceedings of the 1976 Conference at Michigan State University*. Department of Linguistics, Michigan State University.
- Stechow von, Arnim (2000). Some Remarks on Choice Functions and LF-Movement. In: von Heusinger, Klaus & Urs Egli (eds.). *Reference and Anaphoric Relations*. Dordrecht: Kluwer Academic Publishers.
- Sternefeld, Wolfgang (1998a). Programm des Teilprojekts A3. *Sonderforschungsbereich 441, Finanzierungsantrag 1999-2001*. Universität Tübingen.
- Sternefeld, Wolfgang (1998b) Grammatikalität und Sprachvermögen. *SfS-Report*, 02-98.
- Taylor, James B. & Howard A. Parker (1964). Graphic ratings and attitude measurement: a comparison of research tactics. *Journal of Applied Psychology*, 48(1): 37-42.
- Tversky, Amos & Daniel Kahnemann (1971). Belief in the law of small numbers. *Psychological Bulletin*, 76: 105-110.
- Uribe-Etxebarria, Myriam (in press). In-situ Questions and Masked Movement. In: Pica, Pierre & Johan Rooryck (eds.). *Linguistic Variation Yearbook*, vol. 2. Amsterdam, Philadelphia: John Benjamins.
- Wahl, Klaus, Michael-Sebastian Honig & Lerke Gravenhorst (1982). *Wissenschaftlichkeit und Interessen. Zur Herstellung subjektivitätsorientierter Sozialforschung*. Frankfurt am Main: Suhrkamp.
- Winford, Donald (1996). The problem of syntactic variation. In: Arnold, Jennifer, Renée Blake, Brad Davidson, Scott Schwenter & Julie Solomon. *Sociolinguistic Variation: Data, Theory, and Analysis: Selected Papers from NWAV 23 at Stanford*. CSLI Publications, Stanford University.
- Wunderli, Peter & Petra Braselmann (1980). L'intonation des phrases interrogatives: Le type ,Tu vas où ?'. *Studii Si Cercetari Lingvistice*, 31: 649-660.

- Wunderli, Peter (1982). Die Intonation der Fragen vom Typ ‚Tu penses à quoi ?’. In: Winkelmann, Otto & Maria Braisch (eds.). *Festschrift für Johannes Hubschmid zum 65. Geburtstag*. p. 169-181. Bern, München: Francke.
- Wunderli, Peter (1983). L’intonation des phrases interrogatives du type: ‚Il est né en quelle année ?’. *Romanica Gandensia*, 20: 169-181.
- Wunderli, Peter (1984). L’intonation des questions sans marque segmentale. *Travaux de Linguistique et de Littérature (Strasbourg)*, 22(1): 203-250.