Abstract

Coherence generally refers to a kind of predicate formation where a verb forms a complex predicate with the head of its infinitival complement. Adjectives taking infinitival complements have also been shown to allow coherence, but the exact conditions for coherence with adjectives appear not to have been addressed in the literature. Based on a corpus-study (supplemented with grammaticality judgements by native speakers) we show that adjectives fall into three semantically and syntactically defined classes correlating with their ability to construct coherently. Non-factive and non-gradable adjectives allow coherence, factive and gradable adjectives do not allow coherence and non-factive and gradable adjectives are tolerated with coherence. On the basis of previous work on coherence in German we argue that coherence allows a head and a dependent of this head to be associated with different information structural functions. In this sense coherence is like an extraction structure, when the extracted constituent has a different information structural status that the constituent from which it is extracted. Following literature on the information structural basis of extraction islands, we show how the lack of coherence with factive adjectives follows from their complements' being information structurally backgrounded, while the infinitival complements of non-factive adjectives tend to a higher fusion with the matrix clause. We also show that coherence is observed with attributive adjectives as well, arguing that coherence is not a distinct verbal property. Finally we provide an analysis of coherence with adjectives within HPSG.

1 Introduction

Originating with the ground-breaking work on non-finite verbs in German in Bech (1955/1983) coherence refers to a kind of complex predicate formation, which has primarily been studied for verbs taking infinitival complements. Depending on the governing verb, an infinitival complement can either be incoherent or coherent as exemplified for the verb *versuchen* ('to try') in (1) and (2).[1]

(1)   sie habe ebenfalls versucht, [es ihm beizubringen], behauptete Britta [2]
           she had also   tried   it him to teach   claimed   Britta

           'she had also tried to teach him it, Britta claimed'

(2)   Wir glauben, dass sie ihn mehrfach [zu ermorden versucht] haben[3]
           We think   that they him repeatedly to kill   tried   have

[1] The examples are extracted from the *Digitales Wörterbuch der Deutschen Sprache* of the Berlin-Brandenburgische Akademie der Wissenschaften (http://www.dwds.de) and *COSMAS-II* of the Institut für Deutsche Sprache (IDS) in Mannheim (http://www.ids-mannheim.de/cosmas2/web-app/).

[2]Degenhardt, Franz Josef, Für ewig und drei Tage, Berlin: Aufbau-Verl. 1999, p. 297.

[3]Salzburger Nachrichten, 27.04.1995; ETA-Attentate sind ein "Berufsrisiko" für Spitzenpolitiker.

'We think that they have tried to kill him several times.'

In the incoherent construction in (1) the infinitival complement forms a separate constituent with a distinct grammatical function. The infinitival complement *es ihm beizubringen* ('to teach him') is extraposed. In the coherent construction in (2) the infinitival complement is completely integrated into the matrix clause. The infinitive forms a complex predicate with the embedding verb *versuchen* ('try') and the complements of the infinitive can occur interspersed with the complements of the matrix clause and can even scramble to the left of the subject ("Long scrambling"). In addition, an adjunct embedded within the infinitive can take scope over the matrix verb. This is shown in (2) for the adjunct *mehrfach* ('repeatedly'). The intended reading is that *they made several attempts to kill him* and NOT *they made attempts to kill him several times*. This scoping is only expected if the infinitival complement does not form a phrase on its own.[4]

Adjectives taking infinitival complements (henceforth: IAs) such as *bereit* ('willing to') or *eifrig* ('eager to') have also been shown to be able to construct incoherently as as well coherently, i.e. to be able to form complex predicates with their infinitival complements (Askedal, 1988, 1999, 2008; de Kuthy and Meurers, 2001; Gallmann, 1997; Zifonun et al., 1997). Cf.

(3) dass die Kammer von Anfang   an   **bereit**   war, [einen
     that the chamber from beginning PART prepared was   a
     Vergleich   abzusegnen][5]
     compromise to accept

     'that the chamber was prepared to accept a compromise from the very
     beginning

(4) Daß [ihm] Knaack und Wellmann [zu helfen **bereit**   waren], ...[6]
     that him Knaack und Wellmann to help   prepared were

     'that Knaack and Wellmann were prepared to help him'

In (3) the infinitive forms a separate (extraposed) constituent, in (4) the infinitive forms a complex predicate with the adjective. The dative object *ihm* ('him') of the infinitive *helfen* ('help') has been scrambled to the left of the subject of the copular verb *waren* ('was') ('Long Scrambling') while the infinitive *helfen* ('to help') forms a single complex predicate with the adjective *bereit* ('prepared to') and the copula *waren* ('were').

This striking similarity between adjectives and verbs taking infinitival complements begs the question whether all IAs can construct coherently or whether adjectives – just like verbs – differ in their ability to construct coherently. And if

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[4]Further differences between the incoherent and the coherent construction will be discussed below.

[5]Degenhardt, Franz Josef, Für ewig und drei Tage, Berlin: Aufbau-Verl. 1999, p. 142.

[6]Wilamowitz-Moellendorff, Ulrich von, Erinnerungen 1848-1914, Leipzig: Koehler, 1928., p. 73589.

so, how can this difference in the ability to construct coherently be explained. To our knowledge this question has not yet been addressed in the literature. A second question concerns the verbal status of "coherence". Askedal (1988, p. 122) claims that coherence is only relevant for verb dependent adjectives. Since verb dependent adjectives form complex predicates with their governing verb (Müller, 2002), coherence is thus essentially situated in the verbal domain. The question is, however, whether attributively used adjectives with infinitival complements really always construct coherently. To our knowledge this question has not been addressed in the literature either.

In this paper we show that IAs essentially fall into three classes: optionally coherent adjectives, weakly incoherent adjectives and strongly incoherent adjectives.[7] The distinction between these three classes has semantic correlates: The first class consists of non-factive, ungradable adjectives, the second class consists of non-factive, gradable adjectives and the third class consists of factive, gradable adjectives. While the first and the third class are very uniform in their syntactic behaviour, the class of weakly incoherent adjectives has an intermediate status. These adjectives can construct coherently but are very reluctant to do so. Building on the analysis of the information structure of coherent and incoherent constructions in Cook (2001) we show how factivity can form the basis of an information structural account of the divergent syntactic behaviour of the adjectives. This account also explains the constraints on extractability and linearization of the infinitival complement within the sentence bracket for the different adjective classes. We further show that coherence is also observed in attributive structures and we provide an analysis of coherent and incoherent adjectives within HPSG.

2   Adjectives and the incoherent/coherent distinction

The adjectives under consideration in this study are adjectives selecting a subject and an infinitival complement. Adjectives taking infinitival complements as subjects such as *spannend* ('exciting') do not have a bearing on the coherence/incoherence-distinction since infinitival subjects are always incoherent. [8] An example of an adjective with a subject and an infinitival complement is given in (5).

(5)   Der in Europa festgestellte Typ A ist imstande, eine Epidemie zu
         the in Europe observed   type A ist capable   an   epidemic to
         verursachen.[9]
         cause

         'The type A observed in Europe is capable of causing an epidemic.'

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[7]As noted in Reis (2001) there are no obligatory coherent adjectives in German.

[8]Exceptional cases of "split-subject"-infinitives are mentioned in (Askedal, 1988) and are not dealt with here.

[9]Salzburger Nachrichten, 21.11.1995; Influenza vom Typ A ist zu europaweiter Epidemie bereit Virologe .

IAs select oblique complements, i.e. complements headed by a preposition as in (6). When the adjective combines with an infinitival complement, the complement is (optionally) doubled with a pronominal adverb containing the preposition as its second part (viz. (7).

(6) Ich bin gar nicht überrascht [über den Inhalt des Briefes][10]
     I   am at all not surprised   over the content of this letter
     'I am not surprised at the contents of this letter at all'

(7) Er war zunächst etwas   überrascht (darüber), [mich auf dem
     he was at first   somewhat surprised   thereover me   on the
     Herausfordererthron   zu sehen] [11]
     throne of the challenger to see
     'At first he was a little surprised to see me on the throne of the challenger'

All IAs exhibit subject control and they denote a relation between an experiencer and a "subject-matter"-argument (Landau, 2001). The overwhelming tendency is for IAs to construct incoherently. The infinitival complement forms a separate constituent which is either extraposed or in the first position of the clause (SPEC of CP).[12] However, as occasionally noted in the literature, these adjectives can also construct coherently (see references above). In the example in (8) the adjective *bereit* ('prepared to') constructs coherently with the infinitive *zu zahlen* ('to pay'). The example illustrates two diagnostics for coherence: We find Long Scrambling of the dative object *ihm* ('him') and an adjunct *nicht* ('not') taking scope over the governing adjective although it is linearized before the infinitive.

(8) Er wollte nur das Geld. Das   [ihm] die "Presse" aber   [nicht]
     he wanted only the money. Which him the "Presse" however not
     zu zahlen bereit   war.
     to pay   prepared was[13]
     'He only wanted the money. Which, however, the "Presse" was not prepared to pay him.'

Parallel to verbs taking infinitival complements, IAs are also found in constructions that are not easily identified as either coherent or incoherent. IAs are also found in the so-called Third Construction where the infinitive occurs in the extraposed position and a dependent of the infinitive occurs within the embedding construction (Hinrichs and Nakazawa, 1998; Wöllstein-Leisten, 2001).

(9) Wer [den Preis] nicht bereit   ist [zu zahlen], ... [14]
     who the price not   prepared is to pay

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[10]Brief von Irene G. an Ernst G. vom 05.04.1938, Feldpost-Archive mkb-fp-0270, p. 304.

[11]Moers, Walter, Die 13 1/2 Leben des Käpt'n Blaubär, Frankfurt a.M.: Eichborn 1999, p. 540.

[12]Intraposed incoherent infinitives appear to be very rare with adjectives. We return to this issue below.

[13]Die Presse, 07.10.1997, Ressort: Inland; Die Ehre des Walter Meischberger.

[14]www.tweakpc.de/.../45000-windows-vista-wird-guenstiger-post441238.html (24/2 2010).

'whoever is not prepared to pay the price'

And parallel to verbs taking infinitival complements, intraposed infinitival constructions can be structurally ambiguous. In (10), the infinitive can be incoherently linearized in the middle field (indicated with square brackets), or it can be coherent with the infinitive as part of a verbal complex and the object linearized in the middle field (indicated with brackets).

(10)   fraglich   ist, ob die Niederlande ([ihre Gebiete   in Amerika)
        questionable is if Holland   its   territories in America
        (aufzugeben] bereit   sind)[15]
        to give up   prepared is
        'the question is whether Holland is prepared to give up its territories in America'

Thus IAs appear to be exactly like verbs taking infinitival complements in that the very same constructions are observed with adjectives as with verbs. The question is, however, whether adjectives - just like verbs - differ as to whether they allow coherence. And if so, what kind of adjectives allow coherence.

3 Coherent and incoherent adjectives

To find out which adjectives allow coherence we investigated the syntax of app. 80 IAs in the two corpora *Digitales Wörterbuch der Deutschen Sprache* and *Cosmas* of the Institut für Deutsche Sprache in Mannheim. This investigation confirms that adjectives generally tend to construct incoherently, but also that the IAs split in their ability to construct coherently. Some adjectives occur in both the coherent and the incoherent construction while others only occur in the incoherent construction. The following table gives some examples.

Coherent and incoherent	Only incoherent
Disposition	*Emotion*
fähig ('able')	beunruhigt ('disturbed')
abgeneigt ('disinclined')	dankbar ('grateful')
imstande ('able')	verwundert ('surprised')
kompetent ('competent')	zuversichtlich ('confident')
willig ('willing')	eifrig ('eager')

Interestingly, the adjectives in the two classes are semantically coherent. The adjectives in the first class denote a relation of personal disposition towards the denotation of the infinitival complement (**Disposition**). This group corresponds

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[15]o.A., Übersicht über die Weltbevölkerung nach Erdteilen, in den 144 Staaten, in den von 14 Staaten abhängigen Gebieten und in den 142 Millionenstädten [30.05.68], in: Archiv der Gegenwart 38 (1968), p. 13945

to the group of *Dispositionsadjektive* ('Dispositional Adjectives') in the semantic classification of IAs in Stark (1988), even though our classification is based on syntactic criteria. The adjectives in the second class denote a relation of emotional attitude towards the denotation of the infinitival complement (**Emotion**) (cf. also the psychological predicates in Landau (2001)).

The optionally coherent (i.e. Disposition) adjectives share a host of further properties. The adjectives in this class are all ungradable. They do not license intensifying *so* ('so') as gradable predicates otherwise do (Umbach and Ebert, to appear).

(11)   * Peter ist so imstande / willig
          Peter is so capable   / willing

The majority of these adjectives selects the preposition *zu* ('towards') for their complement, i.e. they optionally occur with the pronominal adverb *dazu* ('there-towards') when selecting an infinitival complement. The adjectives are non-factive and do not presuppose the truth of their complement. On the contrary, the infinitival complement is future-oriented, hence unrealized. Finite complements are very rare compared to infinitival complements. For all the adjectives in this group. finite complements are attested, but they are not accepted by all speakers.[16]

(12)   auch die SPD, so   Fraktionschef Gebhard Schönfelder, ist
          also the SPD according.to Fractionleader Gebhard Schönfelder is
          bereit,   dass die Straße umbenannt wird[17]
          prepared that the street renamed   is
          'according to fraction leader G.S. the SPD is also prepared to have the street renamed'

The second class, i.e. the class of adjectives that only construct incoherently is much more heterogeneous. They only share one property: they are all gradable, i.e. they license intensifying *so* ('so'):

(13)   Peter ist so verwundert / eifrig.
          Peter is so surprised   / keen
          'Peter ist so surprised/eager.'

Otherwise two distinct subgroups can be discerned within this class. The first subgroup are adjectives such as *erpicht* ('keen on'), *zuversichtlich* ('confident') and *eifrig* ('eager'). They denote a certain attitude of the subject referent to-wards the denotation of the VP. Most of the adjectives in this subgroup tend to

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[16]In examples such as (12) there appears to be a kind of semantic coercion taking place. The example in (12) can be interpreted to mean that the SPD is prepared to to accept that the street is renamed, i.e. the infinitive is omitted.

[17]Nürnberger Nachrichten, 27.04.2006; Verschwindet – Meiser-Straße? – Streit um Ex-Bischof: Auch SPD ist für Umbenennung.

select the preposition *auf* ('on') (and concomitantly the pronominal adverb *darauf* ('thereon')). They are very rare with finite complements and they are non-factive. Just like the adjectives in the first class they select future-oriented, hence unrealized VP denotations We term these adjectives *Attitudinal adjectives*.

The second subgroup comprises adjectives such as *verwundert* ('surprised'), *dankbar* ('grateful') and *überrascht* ('surprised'). The majority of the adjectives in this subgroup selects the preposition *über* ('over') (and concomitantly the pronominal adverb *darüber* ('thereover') and for these adjectives finite clauses with *dass* ('that') appear to be the preferred complementation. Infinitival complements are restricted to verbs of perception, such as: *erfahren* ('learn'), *entdecken* ('discover') and *sehen* ('see'), or passive or perfect infinitives when the matrix copula is in the present (cf. (Norrick, 1978, p. 33) for English). We term these adjectives *Emotion Adjectives*.

(14)   Monika Walser, [...], ist überrascht, mit solchen Überlegungen
        Monika Walser   is surprised   with such   speculations
        konfrontiert zu werden.[18]
        confronted   to be

        'Monika Walser is surprised to be met with such speculations'

The Emotion Adjectives are factive, i.e. they presuppose the truth of their complement also under negation. Furthermore they allow interpolation of *die Tatsache* ('the fact') when occurring with a finite clause (Norrick, 1978) and occasionally also when occurring with an infinitival complement.

(15)   Beim Blick auf die gigantische Kulisse und das schwarz-rote
        At   sight of the gigantic   schene and the black-red
        Fahnenmeer war ich [glücklich] wie nie   zuvor über [die Tatsache],
        sea of flags was I   happy   as   never before over the fact
        Club-Fan zu sein.[19]
        club-fan   to be

        'Looking at the gigantic scene and the sea of black and red flags I felt as happy as ever to be a club-fan.'

4   Coherent and incoherent adjectives revisited

In view of the heterogeneity of the adjectives in the class of (apparently) obligatorily incoherent adjectives we decided to take a closer look at the syntax of IAs in German. We carried out a pilot study where informants judged the grammaticality of constructed sentences with adjectives from the three classes above. In this study we not only tested the ability to construct coherently, we also tested whether the

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[18]St. Galler Tagblatt, 16.02.2000, Ressort: TB-SG (Abk.); Scharf beobachtete Spende.

[19]Nürnberger Zeitung, 29.05.2007, p. 4; Das Final-Tagebuch einer echten Cluberin Die gröte Belohnung für ein strapaziertes Fan-Herz.

adjectives allow *wh*-extraction out of the infinitival complement and whether the adjectives allow their infinitival complement to be intraposed, i.e. to be linearized within in the middle field of the matrix construction. These two last cases are illustrated for an Emotion Adjective below (along with the judgements).

(16)   * [Was$_i$] war die Polizei verwundert, e_i bei dem Fahrgast   zu entdecken?
           what   was the police   surprised   at   the   passenger to discover
         'What was the police surprised to discover on the passenger?'

(17)   * Die Polizei war [die Waffe   bei dem Fahrgast   zu entdecken] sehr
           the   police   was the weapon at   the   passenger to find   very
         verwundert.
         surprised
         'The police was very surprised to find the weapon on the passenger.'

The pilot study confirmed our initial observations from the corpus, namely that one class of adjectives allows coherence, while another class of adjectives does not lend themselves easily to coherence. However, it also revealed that the group of seemingly incoherent adjectives is not as homogeneous as the corpus investigation suggested. The class of Disposition Adjectives is fine with all the tested constructions: incoherence, coherence, *wh*-extraction and intraposition. The class of Attitudinal Adjectives prefers to construct incoherently. However, coherence, *wh*-extraction and intraposition are not as severely rejected as is the case with the last group of adjectives, the Emotion Adjectives. The class of Emotion Adjectives only allows the incoherent construction as far as we can tell at present. So we end up with three classes of adjectives. The following table summarizes the findings of the pilot study.

Class	Incoherent	Coherent	*wh*–extraction	Intraposition
Disposition	OK	OK	OK	OK
Attitude	OK	??	?	?
Emotion	OK	*	*	*

The pilot study suggests a connection between the ability to construct coherently and the ability to allow extraction out of the infinitival complement and intraposition. When an adjective allows coherence (albeit reluctantly) it also allows extraction and intraposition. The study further reveals that the Attitudinal Adjectives have an intermediate status: certain properties pull towards coherence, other pull towards incoherence. If we try to relate the result of the pilot study to (some of) the properties uncovered above, we arrive at the following picture.

+/−C	Weakly −C	Strongly −C
−factive, −grad	−factive, +grad	+factive, +grad
Disposition	*Attitudinal*	*Emotion*
fähig	eifrig	beunruhigt
abgeneigt	interessiert	dankbar
imstande	erpicht	verwundert
kompetent	zuversichtlich	verblüfft
bereit		

Non-factivity and non-gradability pattern with coherence, while gradability and factivity pattern with incoherence. The Attitudinal Adjectives are in the middle: non-factivity pulls towards coherence, gradability pulls towards incoherence.

Parallel to the verbs we thus find that there is a continuum between optional and obligatory incoherence (cf. a.o. Cook (2001); Sabel (2002)). This continuum appears to correlate with semantically defined classes of adjectives, the parameters being factivity and gradability. In the next section we will provide an explanation for the correlation between factivity and coherence - and between coherence and extraction/intraposition.

5 The information structure basis of the incoherent/coherent distinction

In this section, we will present our claim that the incoherent/coherent distinction has a basis in information structure (IS) and we will argue that the behaviour of the different classes of IA finds a natural explanation under this claim. Information struture refers to the context-dependent way in which an utterance may be structured with respect to notions such as topic and focus. We assume two distinct levels of partioning (following e.g. Krifka (2007) and many others), namely Topic – Comment and Focus – Background.

For the classes of IAs that allow both coherence and incoherence (i.e. the disposition and attitudinal classes), we argue that the actual choice between incoherence and coherence is conditioned by issues of information Structure, cf.(Cook, 2001) for the same proposal for infinitival complements of optionally coherent verbs such as e.g. *versuchen*('try'). While previous HPSG teatments of coherence with verbs taking non-finite complements have formally modelled this optionality, they have never actually offered a motivation as to what governs the choice in actual use. In this respect, the present proposal covers new ground. The crux of our claim for the IAs which allow either construction mode is that in discourse contexts in which the VP-proposition of the infinitival complement constitues a discreet IS unit not involving any VP-internal IS partitioning, the incoherent structure is used. The coherent mode of construction (i.e. complex predicate formation), on the other hand, is chosen in discourse contexts in which any argument can instantiate topic or focus i.e. in which the VP-proposition may be internally information structurally

partioned. In this repect, then, the behaviour of the complex predicate is analagous to that of a simplex verb in permitting information structural statuses (Topic, Focus) to be, in principle, distributed throughout the clause. We will discuss the class of emotion IAs, which only licenses incoherence, in the following section where we will argue that this behaviour has its source in the fact that their complement is obligatorily backgrounded. This, in turn, also relates to information structuring since as we we will show below.

We now turn to evidence supporting our claim. Recall that there are certain constructions which may only occur with coherence. These include, for example, Long Scrambling, and wide scope readings of modifiers, as illustrated in section 1 above. Conversely, there are certain constructions which are only found with incoherence, e.g. extraposition of the infinitival complement seen in section 1. There are further constructions associated either only with coherence or only with incoherence not yet discussed here, an overview of which can be found in Müller (2002, 2.1.2). First, we will focus on incoherence and the lack of VP-internal IS partioning we claim one finds there. What is immediately striking in connection with this claim is the fact that most of the constructions that are associated with (and taken as diagnostics of) incoherence have in common that the lexical material corresponding to the VP-proposition must be linearized as one contiguous syntactic unit which can – we believe – be argued to be isomorphic with one single, non-internally-partioned information structural unit. We will illustrate this with respect to the following diagnostics of incoherence: (i)the acceptability of relative clause pied-piping, (ii) the ungrammaticality of partial VP-fronting and (iii) the ungrammaticality of cluster fronting. In each case we see that for these constructions the emotion IAs pattern with verbs classed as obligatorily incoherent in the literature such as e.g. *"berreden*('convince'). First, relative clause pied-piping is a relativization strategy in which the infitival VP is pied.pied and realised at the left periphery tpgetehr with the realtive pronoun, as shown in () here. We see that it maintains a contiguously realized VP-unit and it is acceptable only with incoherent predicates.

(18) a.   ein Buch, **das zu lesen** er sie überredet hat (-C verb)
            a book which to read he her persuaded has

      b.   ein Buch, **das**   **zu lesen** er glücklich war (-C emotion adj.)
            a   book which to read he happy   was

Second, partial VP-fronting is a topicalization strategy which demands split linearization of the VP-unit. The zu-infinitive is in initial position and its dependent direct object is realized in the middle field. It is not licensed by incoherent predicates in contrast to coherent ones as shown by the following contrast:

(19) a.   * **zu lesen** hat er sie **das Buch** überredet (-C verb)
            to read has he her the book persuaded

b. * **zu lesen** war er **das Buch** enttäuscht   (-C emotion adj.)
   to read   was he the book disappointed

(20) a. **zu lieben** hat er **das Pferd** versucht (+C verb)
        to love   has he the horse tried

   b. **zu lieben** war er **das Pferd** bereit   / fähig (+C disposition adj.)
      to love   was he the horse willing / able

Finally, cluster fronting is a topicalization strategy which also demands split linearization of the VP-unit since a purely verbal string is fronted. It is out for incoherent predicates in contrast to coherent one sas shown here:

(21) a. * **zu lesen** überredet hat er sie **das Buch** (-C verb)
        to read   persuaded has he her the book

   b. * **zu lesen** enttäuscht   war er **das Buch** (-C emotion adj.)
      to read   disappointed was he the book

By contrast, it is fine for coherent predicates

(22) a. zu lieben versucht hat er das Pferd (+C verb)
        to love   tried   has he the horse

   b. zu lieben bereit/fähig war er das Pferd (+C disposition adj.)
      to love   willing/able was he the horse

It is highly plausible to assume that topicalized strings in V2 languages such as German (which normally reserve the initial position in main clause declaratives for the instantiation of one IS function; be it topic, focus or contrast) must constitute one IS unit. It also seems plausible to extend this assumption to the case of relative clause-pied piping. Above all, this set of data are introduced here to reinforce our claim by illustrating that certain constructions which split up the VP-unit syntactically are ruled out with incoherence and that, if one believes this structural split reflects an IS split or partitioning within the VP, this supports our idea that the incoherent mode of construction is typified by the absence of IS-partioning within the VP-denotation.We summarize this in tabular form here:

	Coherent	Incoherent
relative cl. pp.	*	OK
partial VP-fronting	OK	*
cluster fronting	OK	*

Concluding this section, we comment briefly on the relation between coherence and the possibility of IS partioning. The constructions associated with (or diagnostic of) coherence (e.g. Long Scrambling, Cluster fronting) all involve the VP-proposition not forming a syntactic constituent; and arguably, we belive, not forming an IS unit either and thus we propose that the VP-proposition of coherent

predicates is not constrained to map to a single, discreet, non-partioned IS-unit. We assume that within this group of IAs allowing both modes of construction, there will be variation in the degree to which particular adjectives tends towards the incoherent or the coherent mode of conctruction. Our pilot study has already revealed that disposition adjectives alternate more freely than the attitudinal adjectives, which tend more towards the incoherent mode of construction. We would hope that further study of the IS behaviour of these adjectives will permit a more fine-grained analysis of this gradience to be put forward.

6   Emotion IAs and obligatory incoherence

Recall from our pilot study reported above that the infinitival complements of the emotion IAs such as *enttäuscht* ('disappointed'), *deprimert* ('depressed'), *verwundert* ('surprised') resisted coherence strongly and were even opaque for wh-extraction. A pertinent question is, of course, why it should be the case that it is precisely the emotion IAs that demand incoherence and resist extraction and, whether our claim about the IS basis of the coherence dichotomy can shed any light on this fact ?

We will argue that the VP-proposition of emotion adjectives lacks internal IS partitions and that this is even grammatically (for us, lexically) encoded rather than just being, say, an IS preference. In turn, we assume that the possibility of having VP-internal IS partitions is necessary for licensing extraction out of that VP (as well as being necesary for licensing coherence, as we argued in the preceding section). We propose that the properties of the incoherent (emotion) adjectives which cause them to lack this IS partition-potential (and thus to be opaque for extraction) are the following: The VP-proposition of emotion adjectives is (i) **presupposed** and (ii) **backgrounded**. Since we assume both a Topic–Comment partition and an orthogonal Focus–Background, this means that the complements of emotion IAs would appear to lack both partitions. Let us consider first the link between presupposed status and the presence of a Topic–Comment partition. Evidence for the status of the complement of emotion IAs as presupposed comes from the well-known negation test for presupposition. The complement of emotion adjectives is not in the scope of matrix negation, as illustrated here for *verwundert* ('surprised'):

(23)   Peter war nicht verwundert, von   der Sache zu erfahren
         Peter was not   surprised   about the issue to hear
         = he DID hear about it

Further, there is evidence to suggest that presupposed complements do not have the status of assertions and, in turn, there is evidence to suggest that non-asserted propositions lack a Topic–Comment partition (Ebert et al., to appear; Kuroda, 2005).[20]
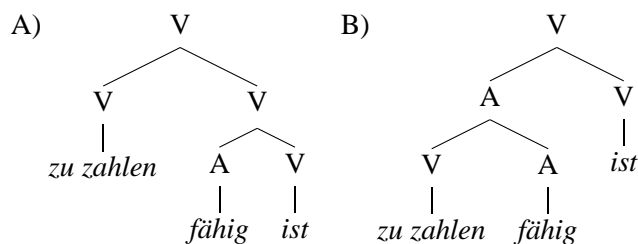
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[20]Further indirect support for this line of thinking might come from the combination of the ideas that (i) only asserted clauses permit embedded root phenomena (Hooper & Thompson 1973) and (ii)

The final ingredient in our account of the emotion IAs' opaqueness for extraction concerns the status of their complement as backgrounded. There is a body of literature addressing the issue of constraints on extraction out of so-called backgrounded constituents see e.g. Erteschik-Shir and Lappin (1979), Goldberg (2006, Chap. 7) Ambridge and Goldberg (2008); Valin and LaPolla (1997) where it is claimed that the complements of certain predicate classes is not "the main point of the utterance", or is not "part of potential focus domain". These complements thus constitute islands for extraction. We assume that extracted elements (fillers) are discourse prominent (Top/Foc) and that these may only originate in complement types that instantiate such the relevant IS partitions. Complements of emotion IAs lack this partition and we therefore see that incoherence in German, which we claim to occur when the VP-denotation lacks IS partitions, blocks/degrades extraction just like islands do.

7   The structure of coherent adjectives

In this section we discuss the syntactic structure of adjectives constructing coherently with their infinitival complement. However, we also have to take into account that these adjectives occur as predicatives of copular verbs. We follow previous analyses of copula verbs and assume that the copula constructs coherently with the predicative adjective, i.e. it forms a complex predicate with the adjective (Müller (2002) a.o.). Thus, for the string in 24 two (binary branching) structures can be envisaged. The two structures are depicted below as A) and B).

(24)   zu zahlen fähig   ist
        to pay   capable is
        'capable of paying'

A)   V   B)   V
            ┌─────┴─────┐   ┌────┴────┐
            V   V   A   V
            │   ┌──┴──┐   ┌───┴───┐   │
         zu zahlen A   V   V   A   *ist*
                     │   │   │   │
                   fähig *ist*   *zu zahlen* *fähig*

In the structure in A) the copula combines with the adjective to form a complex predicate, and this complex predicate in turn combines with the infinitive to form another complex predicate. In this structure, coherence is indeed a verbal property, since a (complex) verb combines with the infinitive. In the structure in B), the adjective combines with the infinitive to form a complex adjective and this complex adjective in turn combines with the copula to form a complex predicate. The

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that embedded root phenomena require a Topic–Comment partition. Both of these claims, however, require further substantiation. Further in this vein, the class of embedders of root phenomena in English overlaps to some extent with the licensors of embedded verb-second in German (Meinunger, 2006) for which it has also been argued that they have assertive character e.g. Truckenbrodt (2006).

crucial question is whether we can find an environment in which an adjective constructs coherently with an infinitive without the intervention of a copula verb. Such an environment would be the attribuive use of an adjective selecting an infinitival complement.

Coherence has been argued to be a property of verbs, and Askedal (1988, p. 122) even claims that the attibutive use of adjectives is irrelevant to the notion of coherence. Many of the usual tests for determining coherence are in fact inapplicable for attributive structures given that scrambling and fronting of verbal substrings do not occur within attributive structures. However, the scope of sentential adverbs such as negation still serves to identify coherent structures. If a negation occurring before an infinitive is able to scope over an attributively used adjective, the construction must be coherent. Attributive use of adjectives with infinitival complements is very rare due to the complexity of the resulting structure.[21] However, these structures do occur in authentic texts.[22] Cf. the following examples.

(25)   der die Kosten   der   Generalsanierung des   Aufzuges nicht zu
        the the expenses of.the main restoration   of.the elevator   not   to

        tragen bereite   Liegenschaftseigentümer [23]
        cover   prepared apartment owner

        'the owner who is not prepared to cover the cost of a major refurbishment of the elevator'

(26)   Maresa Hörbiger als die Konventionen ihres   Standes [nicht zu
        Maresa Hörbiger as the conventions   of.her class   not   to

        sprengen fähige] Gabriele,...[24]
        break   capable Gabriele

        'M.H. as Gabriele, who is not able to break the conventions of her class'

In (25) the intended reading is *the owner is not prepared to pay for the main restoration* and in (26) the intended reading *she is not able to break the conventions of her class*. Thus, in these two cases an adjunct embedded within the infinitive is able to scope over the adjective, indicating that the adjective does indeed form a complex predicate with the infinitive. With Emotion Adjectives in attributive use the negation element can only scope over the embedded infinitive. The intended reading in (27) is *the mother is worried NOT to hear from her daughter* with the adjunct taking scope only over the infinitive and not the embedding adjective.

(27)   ? Die von ihrer Tochter   nicht zu hören beunruhigte Mutter
          the from her daughter not   to hear worried   mother
          'the mother who was worried not to hear from her daughter'

---

[21]The attributive use of these adjetives is even doomed "ungrammatical" in Weber (1971, p. 198).

[22]Interestingly these examples often contain errors. In the example in (26) a definite article is missing.
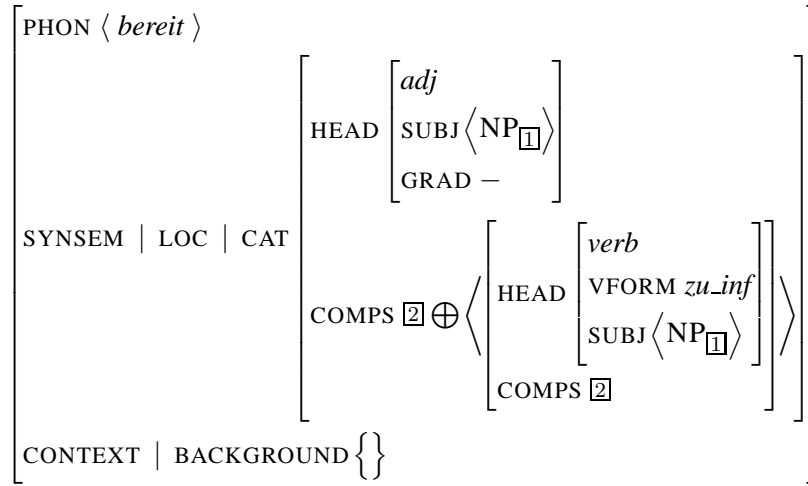
[23]Peter Garai: Die Gemeinschaftsanlage. Wohnrechtliche Blätter 22, 6-11 (2009), p. 9.

[24]Tiroler Tageszeitung, 26.05.1999, Ressort: Regional Osttirol; Theaterreihe klang hoffnungsvoll aus.

As these examples show, the adjective is able to construct coherently without the intervention of a copula verb. This shows that the structure in B) above is independently needed and this is the structure we will assume for adjectives constructing coherently.

8   An HPSG-Analysis

We follow previous work on coherence in HPSG (a.o Hinrichs and Nakazawa (1994); Meurers (2000); Müller (2002); Müller (2009)) and treat complex predicate formation as argument attraction. A lexical head combines with a subcategorized lexical head and inherits the argument structure of the incorporated element. The lexical entry for *bereit* ('willing to') (Disposition) is shown below.

$$
\begin{bmatrix}
\text{PHON} \; \langle \; \textit{bereit} \; \rangle \\[2ex]
\text{SYNSEM} \mid \text{LOC} \mid \text{CAT}
\begin{bmatrix}
\text{HEAD}
\begin{bmatrix}
\textit{adj} \\
\text{SUBJ} \langle \text{NP}_{\boxed{1}} \rangle \\
\text{GRAD} -
\end{bmatrix} \\[4ex]
\text{COMPS} \; \boxed{2} \oplus \left\langle
\begin{bmatrix}
\text{HEAD}
\begin{bmatrix}
\textit{verb} \\
\text{VFORM} \; \textit{zu\_inf} \\
\text{SUBJ} \langle \text{NP}_{\boxed{1}} \rangle
\end{bmatrix} \\
\text{COMPS} \; \boxed{2}
\end{bmatrix}
\right\rangle
\end{bmatrix} \\[4ex]
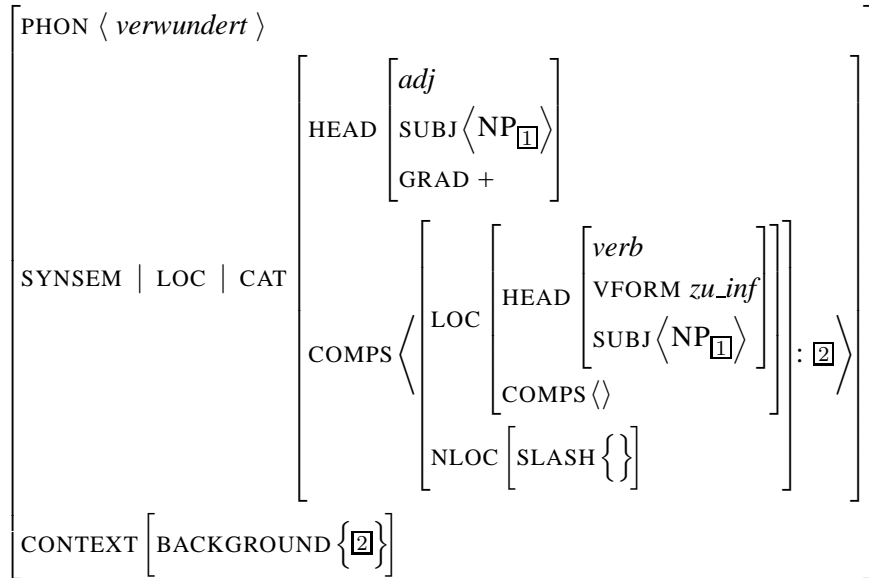\text{CONTEXT} \mid \text{BACKGROUND} \{ \}
\end{bmatrix}
$$

Following the analysis of non-finite verbs in Müller (2009), adjectives have a HEAD-feature SUBJ. The intuition is that the subject of adjectives (and non-finite verbs) never maps to the valency lists. It has to be raised by a copula verb (or another raising verb) or mapped to the MOD-feature when the adjective is inflected. The co-indexation of the SUBJ of the adjective and the SUBJ of the embedded infinitive accounts for the control properties, i.e. that the subject of the adjective is the controller of the unexpressed subject of the infinitive. Following Pollard and Sag (1994) we assume that the feature CONTEXT encodes the appropriateness conditions for the use of the lexical item. The truth of the proposition of the subcategorized verbal complement does not belong to the appropriateness conditions of the adjective, i.e. this proposition is not presupposed and the embedded proposition can have its own internal TC and FB articulation. This is the crucial prerequisite for coherence. The adjective is further lexically specified to be non-gradable. Gradability is treated as a syntactic feature, but nothing hinges on this decision. It can equally well be a semantic notion as long as degree-adverbs (for reasons of selection) can impose restrictions on the gradability of the modified constituent. Note

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further that gradability is treated as a HEAD-feature. This accounts for the fact that degree-adverbs such as the intensifying *so* ('so') selects an A': *er ist so [stolz auf seinen Sohn]* ('he is so proud of his son').

The crucial insight of the analysis of complex predicate formation in Müller (2009) is that one single lexical entry can account for both the coherent and the incoherent construction. The lexical entry for *bereit* ('willing to') shows that the adjective selects a verb specified to be a *zu*-infinitive. However, the lexial entry does not say anything about the COMPS-list. In the incoherent construction the COMPS-list of the selected verb is empty, and the adjective combines with a VP. Consequently, no arguments are inherited from the selected verb onto the adjective and $\boxed{2}$ is empty. In the coherent construction the adjective combines with a V and the entire COMPS-list is inherited onto the adjective.

Next we turn to the lexical entry for the Emotion Adjective *verwumdert* ('surprised') which is obligatorily incoherent.

$$
\begin{bmatrix}
\text{PHON } \langle \textit{verwundert} \rangle \\
\text{SYNSEM } | \text{ LOC } | \text{ CAT}
\begin{bmatrix}
\text{HEAD }
\begin{bmatrix}
\textit{adj} \\
\text{SUBJ}\langle \text{NP}_{\boxed{1}}\rangle \\
\text{GRAD } +
\end{bmatrix} \\
\text{COMPS }\left\langle
\begin{bmatrix}
\text{LOC}
\begin{bmatrix}
\text{HEAD}
\begin{bmatrix}
\textit{verb} \\
\text{VFORM } \textit{zu\_inf} \\
\text{SUBJ}\langle \text{NP}_{\boxed{1}}\rangle
\end{bmatrix} \\
\text{COMPS}\langle\rangle
\end{bmatrix} \\
\text{NLOC}\begin{bmatrix}\text{SLASH}\{\}\end{bmatrix}
\end{bmatrix} : \boxed{2}\right\rangle
\end{bmatrix} \\
\text{CONTEXT}\begin{bmatrix}\text{BACKGROUND}\{\boxed{2}\}\end{bmatrix}
\end{bmatrix}
$$

The obligatorily incoherent adjective *verwundert* selects a VP, a verb phrase constrained to have an empty COMPS list. A condition for the use of an Emotion Adjective is that the embedded proposition obtains, i.e. the proposition is presupposed. Therefore the embedded proposition is a member of the BACKGROUND set, and the prerequisite for constructing coherently is not met. Note further that the adjective is specified to be gradable. Finally the SLASH set of the embedded complement is specified to be empty. In this way extraction out of the subcatagorized complement is blocked.

The following LP-statement accounts for the observation that a VP-complement of an adjective cannot be intraposed. The LP-statement says that a VP cannot linearly precede a selecting gradable adjective.

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$$\boxed{1}\ \text{VP} \not\gg \text{ADJ} \begin{bmatrix} \text{HEAD} \mid \text{GRAD} + \\ \text{COMPS} \left\langle \boxed{1} \right\rangle \end{bmatrix}$$

The following schema based on Müller (2009) accounts for the formation of a complex predicate with an adjective or a verb as the head, given the lexical entries presented above.

complex_pred →

$$\begin{bmatrix} \text{SYNSEM} & \begin{bmatrix} \text{LOC} \mid \text{CAT} \mid \text{COMPS} \boxed{1} \end{bmatrix} \\ \\ \text{HEAD–DTR} & \begin{bmatrix} \text{SYNSEM} \mid \text{LOC} \mid \text{CAT} \begin{bmatrix} \text{HEAD } adj \vee verb \end{bmatrix} \\ \text{COMPS} \boxed{1} \oplus \left\langle \boxed{2} \right\rangle \end{bmatrix} \\ \\ \text{NONHEAD–DTR} & \left\langle \begin{bmatrix} \text{SYNSEM} \boxed{2} \mid \text{LOC} \mid \text{CAT} \mid \text{LEX} + \end{bmatrix} \right\rangle \end{bmatrix}$$

The head daughter is the embedding predicate (A or V) selecting the non-head daughter through the COMPS feature. The non-head daughter is the selected infinitive constrained to be LEX +. Note that the rest of the COMPS-list is passed onto the mother node, i.e. to the resulting complex predicate.

The present approach does not account for the gradience of the coherence/incoherence-distinction observed with both verbs and adjectives. As extensively discussed in Cook (2001) some verbs lend themselves more easily to coherence than others. We have observed a comparable continuum for IAs: Attitudinal Adjectives tend to incoherence but are not as bad in the coherent construction as Emotion Adjectives. Coherence appears to be an option for non-factive adjectives, but Attitudinal Adjectives are degraded since they are gradable in contrast to the Disposition Adjectives. A complete account of this would require weighted schemas for complex-predicate formation.

9 Conclusion

In this paper we have shown that adjectives can indeed construct coherently even in attributive constructions lacking a copular verb. Furthermore we have shown (i) that adjectives split as to whether they allow coherence and (ii) that coherence correlates with transparency for extraction. The class of Disposition Adjectives allow all kinds of structures, the class of Emotion Adjectives only allows incoherence and the class of Attitudinal Adjectives allow coherence, but is very reluctant to do so. We finally showed that coherence with adjectives has an information structural basis. The prequisite for coherence with adjectives is the non-factivity of the adjectives. This was explained as an information structural constraint on coherence. Presupposed complements are bacgrounded and do not allow a separte topic-focus-articulation within the complement.

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