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ON PIED-PIPED INFINITIVES IN GERMAN RELATIVE CLAUSES*

Henk van Riemsdijk
Tilburg University

1. A QUESTION

Among the more curious phenomena in German syntax, we find sentences of the following type:

- (1) a. *Jetzt hat er sich endlich den Wagen, [den zu kaufen]_α er*
now has he to-himself finally the car which to buy he
sich schon lange vorgenommen hatte, leisten können
to-himself already long planned had afford been-able-to
"Now he has finally been able to afford the car which he had
planned to buy for a long time."
- b. *Man hat Maria, [mit der in den Urlaub zu fahren]_α ich*
one has Maria with whom in the vacation to drive I
meinem Kollegen erst vor zwei Tagen empfohlen hatte, gestern
to-my colleague just ago two days recommended hat yesterday
abend tot in ihrem Zimmer aufgefunden
evening dead in her room found
"Maria, with whom I had just two days ago recommended to
my colleague to go on a vacation, was found dead in her room
last night."

These constructions contain relative clauses, usually non-restrictive ones, in which the relative pronoun is contained in an infinitival complement clause. What is remarkable is that the whole infinitival clause, α in the examples in (1), is moved under *wh*-movement. Alongside (1) we also find

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think about the position of α itself. (3) does not specify whether α is in COMP or whether it in some other way occupies a sentence initial position. In view of the fact that *wh*-movement of an overt *wh*-phrase is always obligatory in German relative clauses, it seems reasonable to assume that α in effect does undergo *wh*-movement and hence is in COMP. This instance of *wh*-movement we will call 'external *wh*-movement'. Note that internal *wh*-movement cannot be invoked to satisfy the obligatoriness of *wh*-movement in relative clauses since it cannot guarantee that α will end up in a sentence initial position. In view of these considerations we will assume without further discussion that external *wh*-movement applies and that α is in COMP.⁵

2. THE ANSWER

If it can be shown that the relative pronoun inside α must be in COMP, in other words, that such sentences evidence what we may call 'internal *wh*-movement', then it must *a fortiori* be the case that $\alpha = \bar{S}$. Most of the arguments to be presented below have this structure.

2.1 Position

While the linear order of constituents is relatively free in German, there are nevertheless a number of cases where there is at least a strong preference for one of the possible orders. This is particularly true for unstressed (i.e. clitic-like) pronouns, as in (4).

- (4) a. *Ich nehme es mit ihm auf*
 I take it with him up
 "I challenge him"
 b. ?**Ich nehme mit ihm es auf*

In PPIs the contrast goes the other way:

- (5) a. ?**Mohammed Ali ist ein Mann, es mit dem aufnehmen zu wollen, reiner Wahnsinn wäre*
 Mohammed Ali is a man it with whom up take to
 want sheer madness would-be
 "M.A. is a man, to challenge whom would be sheer madness"
 b. *Mohammed Ali ist ein Mann, mit dem es aufnehmen zu wollen, reiner Wahnsinn wäre*

The assumption that internal *wh*-movement has taken place within the

- b. *Wir haben unseren Sohn mit der Lotte ausgehen lassen*
- (9) a. ?**Wir haben mit diesem Burschen den Hans*
 we have with this boy the Hans
tanzen sehen müssen
 dance see had-to
 "We had to see Hans dance with this boy"
- b. *Wir haben den Hans mit diesem Burschen tanzen sehen müssen*

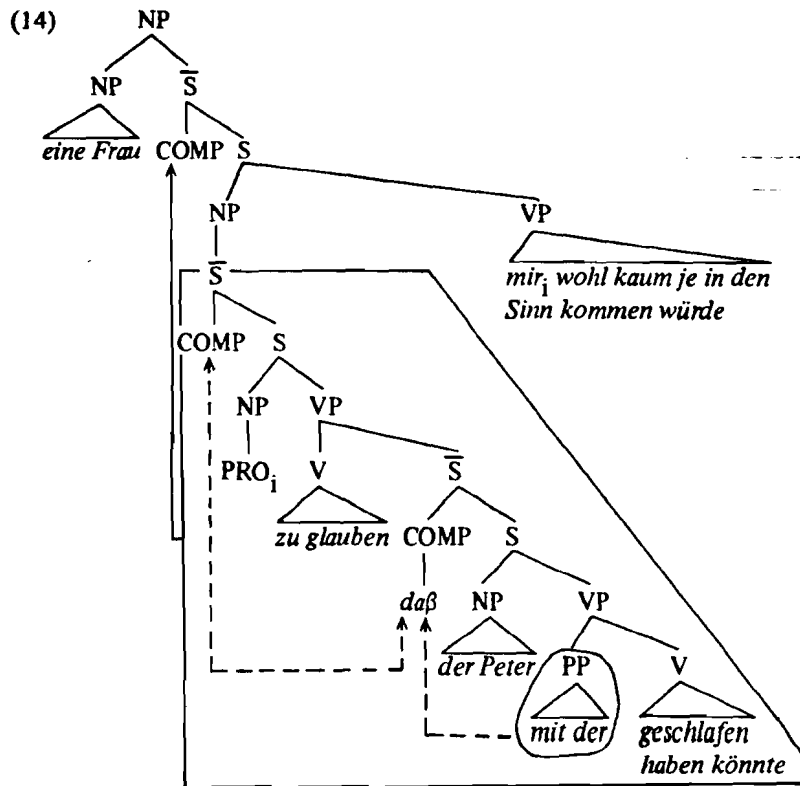
Again, the contrast is inverted in the PPI construction.

- (10) a. *Die Lotte ist ein Mädchen, mit der unseren*
 the Lotte is a girl with whom our
Sohn ausgehen zu lassen mir nun doch
 son go-out to let to-me emph. particles
etwas unratsam erscheint
 somewhat unrecommendable seems
 "Lotte is a girl, to let our son go out with whom really doesn't
 seem recommendable to me"
- b. **Die Lotte ist ein Mädchen, unseren Sohn mit der ausgehen zu*
lassen mir nun doch etwas unratsam erscheint
- (11) a. *Der Bursche, mit dem den Hans tanzen sehen zu müssen,*
 the boy with whom the Hans dance see to have-to
mir grossen Kummer bereitet hat, scheint jetzt einen andern
 to-me great grief caused has seems now an other
Freund gefunden zu haben
 freind found to have
 "The boy to have to see Hans dance with whom has caused me
 great grief, seems to have found another boyfriend now"
- b. **Der Bursche, den Hans mit dem tanzen sehen zu müssen, mir*
grossen Kummer bereitet hat, scheint jetzt einen andern Freund
gefunden zu haben

The ungrammaticality of (10b) and (11b) is again a consequence of the template (6). And it is internal *wh*-movement which makes it possible for (10a) and (11a) to escape from the filtering effect of the template. These facts thus strengthen our assumption that the moved *wh*-phrase must be \bar{S} .

2.2 Consequences of internal *wh*-movement

The conclusion drawn from the phenomena discussed in 2.1, viz. that there is internal *wh*-movement, has two fairly far-reaching further conse-



The iterative PPI effect can be seen in examples such as (15) and (16).

(15) *Noch so ein Mann, den zu überzeugen dir vorzunehmen ich dir unbedingt empfehlen würde, wäre der Chomsky*
 another such a man whom to convince to-you to-plan I to-you definitely recommend would would-be the Chomsky
 "Another man, whom I would definitely recommend that you plan to convince, is Chomsky"

(16) *Die Fernsehreihe, die anzusehen dir zu empfehlen, mir kaum einfallen würde, heißt übrigens 'Dallas'*
 the TV-series which to-watch to-you to recommend to-me hardly occur would is-called by-the-way 'Dallas'
 "The TV-series, which it would hardly occur to me to recommend that you watch, is called 'Dallas', by the way"

2.3 The anti-crossover effect

There is a further argument to the effect that α in (1) must be taken to be \bar{S} , and this argument is independent of the question as to whether there is internal *wh*-movement. It has to do with the so-called anti-crossover effect.⁸

The well-known crossover situation can be characterized as follows: *wh*-phrases, and all their parts, behave with respect to rules of (non-) coreference as if they had *not* been moved. In example (18), *wessen* and *sie* cannot be coreferential, a fact which corresponds directly to the situation in the parallel example (19) in which no *wh*-movement has taken place.

- (18) **[Wessen_i Wagen]_j glaubt sie, daß er e_j genommen hat?*
 whose car believes she that he taken has
 "Whose car does she believe that he has taken?"
- (19) **Glaubt sie_i, daß er Monikas_i Wagen genommen hat?*
 believes she that he Monika's car taken has
 "Does she believe that he has taken Monika's car?"

There is a systematic class of exceptions to this principle which has been known for a long time but has remained unexplained. Examples of this class, which we may call the anti-crossover case, are of the following type.

- (20) [*Welches Bild, das du von der Monika_i gemalt hast,_j glaubst du, dass sie_i schön findet?*
 which picture that you of the Monika painted
 have believe you that she beautiful finds
 "Which picture that you painted of Monika do you believe that she finds beautiful?"

In this sentence, *Monika* and *sie* can be interpreted as coreferential, even though *Monika* is inside the preposed *wh*-phrase and, contrary to the general case, the unmoved variant does not allow coreferentiality.

- (21) * *Glaubst du, daß sie_i das Bild, das du von der Monika_i gemalt hast, schön findet?*
 believe you that she the picture that
 you of the Monika painted have beautiful finds
 "Do you believe that she finds the picture that you painted of Monika beautiful?"

The anti-crossover effect yields yet another argument in favor of $\alpha = \bar{S}$. This argument derives from the contrast between (25) and (27).

- (27) * *Das ist die Frau, [mit der Herr Müller_i bekannt zu machen]_α ich ihm_i niemals raten (= advise) würde*

This contrast can be readily explained on the assumption that the PPI contains the PRO-subject of the infinitive, and hence cannot be VP. Under this assumption the contrast follows directly from the different control properties of the verbs *versprechen* "promise" and *raten* "advise". as is shown by the following representations.

- (28) ...[mit der PRO_i H.M._i bekannt zu machen]_α ich_i ihm_i niemals versprechen würde
- (29) * ... [mit der PRO_i H.M._i bekannt zu machen]_α ich_i ihm_i niemals raten würde

Since *raten* is a verb of object control, PRO and *Herr Müller* are coindexed in (29) but not in (28). Therefore, the principles of (non-)coreference¹¹, will always predict that *Herr Müller* and *ihm* cannot be coreferential, regardless of the anti-crossover effect. If only the VP had been moved, the PRO-subject would have remained in its base position. In that case it would be quite obscure why the anti-crossover effect shows up in one case but not in the other.

On the basis of the arguments presented in this section we may regard two central properties of the PPI construction as firmly established. First, $\alpha = \bar{S}$, and second, inside α internal *wh*-movement applies.

3. FURTHER PROPERTIES

Let us now turn to some further characteristic properties of the PPI construction.

3.1 Infinitives only

It is remarkable that an \bar{S} can only be pied-piped if it is infinitival, i.e. when its inflection marker is [-tense] and hence when its main verb is an infinitive. In other words, sentences of the following type are systematically impossible.

- (30) a. **Das ist der Wagen, [daß er den gekauft hat]_{S_i}*
 that is the car that he which bought has

FOR'S

"The man, whom one needs a lot of luck to catch, has now also disconnected his phone"

Note that if we assume that the infinitival complementizer *um* is not a preposition but a COMP, despite Tappe (1983), the ungrammaticality of (32) will follow from our template (6). And to the extent that internal *wh*-movement has taken place, the DFC filter will yield the same result. Interesting confirmation of this analysis can be found in an example cited in Van de Velde (1977). In this case, an instance of the obligatory *um* is deleted in a PPI-construction.¹⁴

- (33) a. *Eine Musik, deren teilhaftig zu werden man wallfahren*
 a music of-which partaking to become one pilgrim
mußte wie die Amerikaner nach Bayreuth
 had-to like the Americans to Bayreuth
 "A music which one had to undertake a pilgrimage like the
 Americans to Baureuth in order to partake of"
- b. *Man mußte wallfahren wie die Amerikaner nach Bayreuth,*
um/∅ dieser Musik teilhaftig zu werden*

3.2 Consequences of internal *wh*-movement

The necessary assumption of internal *wh*-movement is far from trivial from a theoretical perspective. There is a mostly implicit but nevertheless powerful principle floating around according to which an operator-like element (such as a relative pronoun or a *wh*-phrase) is interpreted (i.e. gets scope) in the COMP-position which it occupies at s-structure. More generally speaking, many linguists assume that there is a virtual isomorphism between structures that result from *move-wh* at s-structure and the corresponding operator-variable representations at LF.

Consider again the structure (3c) which was shown to give a correct characterization of German PPIs. This structure is repeated in tree-form as (34).

(cf. Cinque (1981)). We will not pursue the issue any further in the present context.¹⁹

3.3 The contrast between German and Dutch

In Dutch, sentences with PPI are completely excluded. The Dutch version of (1a), for example, is ungrammatical.

- (40) **Nu heeft hij zich eindelijk de auto, die te kopen hij zich*
 now has he himself finally the car which to buy he himself
al lang had voorgenomen kunnen permitteren
 already long had planned been-able-to afford
 "Now he has finally been able to afford the car which he had
 planned to buy for a long time"

The question arises, then, why these two languages, which are in many respects quite similar, differ so clearly in this respect. The question is all the more pressing since *wh*-phrases in Dutch have essentially the same structure as in German. In other words, they are subject to template (6), or, in terms of percolation, *wh*-features must percolate along left branches. Why, then, does Dutch allow (36a) and (36b) but exclude (36c)?

It would be interesting if this difference could be related to some independently existing difference between the two languages. Such a difference can indeed be found if we study the arrays of possible types of complement clauses in German and Dutch. In Dutch, an infinitival complement clause can only be of one of two types: either it is extraposed or its verb undergoes verb raising. cf. Evers (1975). In the verb raising variant, the complement clause is to the left of the matrix verb, but its verb is extracted and adjoined to (the right of) the matrix verb. Under extraposition, the complement clause as a whole stands to the right of the matrix verb. In German, on the other hand, there is, contrary to Dutch and contrary to Evers' claim, a third type in which the infinitival complement clause as a whole is to the left of the matrix verb and in which verb raising does not apply to adjoin the complement verb to (the left of) the matrix verb.²⁰

Schematically, we have the following situation:

(41)	German	Dutch
a. ... [..... V] \bar{S} ... V	+	-
b. ... [..... \bar{V}] \bar{S} ... V	+	+ (verb raising)
c. ... [[..... V] \bar{S}] ... V	+	+ (extraposition)

- b. ...weil er (uns) drohte, seinen Rivalen zu töten
(control interpretation)
- (45) a. *seine Beherrschung, die zu verlieren er (uns) schon lange drohte
b. ?sein Rivale, den zu töten er (uns) schon lange drohte
(control interpretation)

These arguments establish conclusively that PPI is incompatible with verb raising.

Let us now push the analysis one step further. Verbs which permit the PPI construction are characteristically verbs which can occur in the form $[\dots V]_{\bar{S}} X V$, where $X \neq \emptyset$. In many cases, including many of the examples given in the present article, X is an inherently reflexive pronoun, for example. Observe that in the non-moved variant the alternative order $X [\dots V]_{\bar{S}} V$ is generally also grammatical. Therefore it is not possible to establish with certainty that in the PPI construction X intervened between the complement clause and the matrix verb. In other words it is difficult to choose between (46a) and (46b):

- (46) a. $[_{COMP} [\dots V]_{\bar{S}_1}] NP X [e]_{\bar{S}_1} V$
b. $[_{COMP} [\dots V]_{\bar{S}_1}] NP [e]_{\bar{S}_1} X V$

The weaker fact can be established, however: PPI cases are always such that (46b) can be their structure. This generalization is statistically confirmed by the fact that the corpus of PPI cases which is presented in Van de Velde (1977) contains not a single example which is not amenable to an analysis of the form (46b). In view of this generalization it becomes attractive to speculate that this option, i.e. (46b), is exactly what Dutch lacks. In other words, we may hypothesize that the difference between Dutch and German given in (41) reduces to the following difference:

- | | | | |
|------|-----------------------------|--------|-------|
| (47) | | German | Dutch |
| | $\bar{S} X V$ | OK | * |
| | (where $X \neq \emptyset$) | | |

In addition, we need a principle which excludes the corresponding structures in which the left-hand clausal complement is adjacent to the matrix verb unless verb raising has applied, say (48):

- (48) * $\bar{S} V$

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extraposed clauses appears to be quite plausibly excluded under the assumption of the principles of the government-binding theory, in particular if (proper) government is assumed to be directional (cf. Stowell (1981), Kayne (1983), Hoekstra (1982)). In Dutch and German the verb governs leftward. In this view, the empty category principle (ECP) of Chomsky (1981) will block extraction of an extraposed clause.²⁵

This completes the argument. ECP limits PPI to lefthand complements in Dutch and German. The *VV-filter limits PPI to non-adjacent lefthand complements. And according to (47) non-adjacent lefthand complement clauses can exist in German but not in Dutch. Hence German has PPI but Dutch doesn't. Recall that, unfortunately, this is only half an explanation. The absence of PPI in Dutch is shown to follow from the independent difference (47). However it remains utterly mysterious, at least to the present author, why the difference (47) obtains in the first place.

4. MORE QUESTIONS

This means that, as usual, a small step in the direction of understanding raises many more questions than it answers. In conclusion, let us list some of the more salient ones:

1. Why do Dutch and German differ as stated in (47)?
2. Why do some Romance languages which are otherwise similar to Italian, French for example, lack PPI?
3. Why is internal *wh*-movement in Italian not only not necessary but virtually impossible?
4. Why should a principle like the *VV-filter be operative in a variety of languages?

Future research will hopefully shed some light on these questions. But by way of speculation, let us briefly dwell on the last of these questions. Several proposals have recently been made which provide a more general rationale for the existence of such a filter. Kayne²⁶ has suggested that the core case of the case-filter is *N-NP. Kayne proposed that this core case could be made to follow from some otherwise mysterious principle which requires that predicates take arguments and that arguments be next to predicates. Such a principle, in turn, is close in spirit to Stowell's 'Case Resistance Principle' which requires that there is a bifurcation of categories into case-assigning and case-receiving ones, and furthermore, that

NOTES

1. In most varieties of German 'long *wh*-movement' as in (2) is supposedly ungrammatical. The present article presents the facts from the perspective of the mostly southern variants in which long movement is not excluded. In addition, the degree of ungrammaticality which obtains in northern varieties is relatively low, as compared to, say, island violations. Consequently, the relevant contrasts are assumed to hold for the northern variants as well, albeit at a somewhat lower level of acceptability. Cf. also footnote 5.
2. Cf. Nanni and Stillings (1978) for discussion.
3. Many of these properties are discussed, though somewhat implicitly, in the rich material on the issue of PPI constructions presented in Van de Velde (1977).
4. I ignore here the possibility that the infinitival complement clause might be a VP-complement lacking a PRO-subject. I take such an option to be excluded on principled grounds, cf. Koster and May (1982). More interestingly, the reasoning presented below provides an *a fortiori* argument against such a possibility and in favor of PRO-subjects in infinitival clauses.
5. Tilman Höhle has pointed out to me that for him complement clauses can quite easily precede a personal pronoun subject, which is, again according to him, generally impossible for NPs. He cites the following as an example:

- (i) *Ich habe schon mehrfach betont, daß sie mit diesem Kerl bekannt zu*
 I have already often stressed that her with this guy acquainted to
machen ich mich immer strikt geweigert habe
 make I myself always strictly refused have
 "I have already stressed several times that I have always strictly refused to introduce her to this guy"

I do not share Höhle's intuitions completely. I find that NPs and clauses by and large behave alike in this respect. Cf.

- (ii) ?*... *weil diesen Kuchen ich nicht mag*
 ... because this cake I not like
 "because I do not like this cake"
- (iii) ?*... *weil dies zu sagen ich nicht wünsche*
 ... because this to say I not wish
 "because I do not wish to say this"

Alongside (i), which I would characterize with a question mark, we have (iv):

- (iv) ? *Ich habe schon mehrfach betont, daß eines solchen Vorwurfs ich mich*
 I have already often stressed, that of-a such reproach I myself
immer strikt erwehren würde
 always strictly defend would
 "I have already stressed several times that I would always strongly defend myself against such a reproach"

However, if Höhle is right, little follows because my main argument has to do with the internal structure of α . On the other hand several other problems would arise if we were to assume that α is in sentence initial position by virtue of some process

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of the anti-crossover effect is roughly identical in German and English. Non-sentential right adjuncts in German, for example, produce the crossover effect contrary to Guéron's principle:

- (ii) *Mit welcher Frau vom Scheich glaubst du schläft er am liebsten?*
 with which wife of-the sheikh believe you sleeps he the dearest
 "With which wife of the sheikh do you believe he likes to sleep most?"

10. As expected, the strong crossover effect remains intact for the relative pronoun itself:

- (i) **Das ist die Frau, mit der Herrn Müller bekannt zu machen ich ihr nicht empfehlen würd*
 that is the woman with whom Mr. M. acquainted to make I to-her not recommend would
 "That is the woman to whom I would never recommend her to introduce Mr. Müller"
- (ii) **Das ist die Frau, mit der ich ihr nicht empfehlen würde, Herrn Müller bekannt zu machen*
 that is the woman with whom I to-her not recommend would Mr. M. acquainted to make

11. Such as the binding theory of Chomsky (1981).

12. There are some dialects of German in which it is possible to violate the DFC filter. This is true in particular of Bavarian. The standard varieties of German discussed in the text allow no such violations, however.

Cf. Bayer (1983) and Lenerz (1983). It should also be pointed out that there is one construction in which the obligatory presence of *daß* is overridden by the presence of a *wh*-phrase which takes scope in some higher COMP, as indicated by a scope marker (*was*). The following illustrates this:

- (i) *Was glaubst du wen (*daß) Peter gesehen hat?*
 what believe you whom (that) Peter seen has
 "Whom do you believe Peter has seen?"

See Van Riemsdijk (1983) for a brief discussion of this construction. See also example (39) below.

13. The term purposive is used here in a very loose and unsemantic way to identify the *um-zu* infinitives under discussion.

14. (33a) corresponds to example (94) in Van de Velde (1977).

15. Relative pronouns in German can be either [+w]-pronouns, such as in *womit* "with what" or *zu welcher* "to whom", or [+d]-pronouns, such as *dem* "whom" or *dessen* "whose". This is why I use the neutral feature [+rel].

16. Interestingly, percolation from a true complement position appears to be impossible, in view of the impossibility of pied-piping with postnominal, leftward governing, adjectives (cf. Van Riemsdijk (1981)):

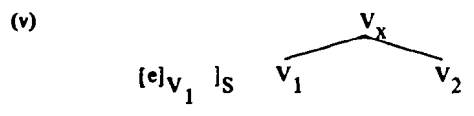
- (i) * *der König, [dem treu]_{AP} er ewig blieb*
 the king to-whom loyal he forever stayed

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Finally, Thilo Tappe suggests that there is a correlation between clitic extraction and long *wh*-movement. According to him, people who do not accept long *wh*-movement also find (42a) awkward. If this correlation holds, it has interesting consequences which, unfortunately, I cannot pursue here.

23. Condition (i), which is the mirror image of the corresponding condition for Italian, is taken to follow from the directionality of government. In German and Dutch, both SOV languages, the verb governs leftward, while in Italian the verb governs rightward since Italian is SVO. Condition (iii), which is also applicable in Italian, follows if participles are neutralized categories, i.e. not analyzable as [+V,-N].

24. (50a) gives the Dutch surface order. The corresponding structure for German would be as in (i):



(50b), which abstracts away from reordering, is, of course, identical for the two languages.

25. It might, in fact, be more correct to say that government into A-positions is directional while government into \bar{A} -positions works both ways to allow for long *wh*-movement out of extraposed complement clauses in languages like Dutch. This view may, however, be problematic in view of the fact that stranding by *r*-movement out of a PP to the right of the verb is excluded:

- (i) **Hij heeft er_i de deur geverfd [e_i mee]_{pp}*
 he has it the door painted with

It is generally assumed that the *r*-position, here e_p , is an \bar{A} -position. If it is, ECP cannot be used to account for the ungrammaticality of (i) under the assumptions stated above.

26. Talk at the 1982 GLOW conference in Paris entitled 'Predicates and Arguments'. Cf. also Hoekstra (1983) for an extension of Kayne's proposal.

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