

## Three people and a piano

Daniel Hole (Freie Universität Berlin)

### 1. Introduction

In this paper I want to investigate the Mandarin version of a problem in focus semantics that has been puzzling researchers for quite a while (cf., for instance, Jacobs 1983: 224ff or König 1991: 51, 101ff). The treatment of this problem does not just give us an opportunity to see how parametric *cái* and *jiù* are used in Mandarin to tell apart readings of sentences that are ambiguous in English. The paper also deals with the notion of translational equivalence. The result will be that translational equivalence is not to be confounded with identity of logical form. This finding may not be entirely new, but the empirical part of this paper illustrates it in an impressive way.

### 2. The English perspective: three-way ambiguity of piano-sentences

Before turning to the Mandarin data the English case will be discussed. One version of the problem is about three people and a piano.<sup>1</sup>

(1) *Only THREE people can move the piano.*

(1) has several readings. For the first reading imagine you want to move your piano to a different room, and only one friend is there to help you. Since pianos are heavy your friend may say: “Sorry, I think we can’t do it alone. Only three people can move the piano.” Let us call this the heavy-piano reading. In this situation the speaker excludes the possibility that the number of people present, namely two, is enough to move the piano. Four or five people would, under most circumstances, also be a possibility, but these alternatives are probably not relevant in this setting.

On the second reading a professional piano transporter deals with a client who enquires about the number of people needed to move a piano. The client thinks that one needs at least five people, but the professional reassures him: “Only three people can move the piano.” I will call this the light-piano reading. Under the circumstances of the light-piano reading it is excluded that more people are needed, and it is implicated, but not entailed or presupposed, that two people would not be enough.

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<sup>1</sup> Small caps mark foci (not just focus exponents).

Let us now compare these entailments and implicatures with what is commonly assumed to be the meaning of *only*. (2) is an example.

- (2) a. *Only JOHN came to the party.*  
b. presupposition/implicature/entailment: John came to the party<sup>2</sup>  
c. entailment:  $\neg\exists x [(x \neq \text{John}) \ \& \ (\text{came to the party } (x))]$   
c'. entailment:  $\forall x [(\text{came to the party } (x)) \rightarrow (x = \text{John})]$

According to (2b) and (2c), (2a) says that John's coming to the party is presupposed, or entailed, or at least implicated, and it is entailed that nobody apart from John came to the party. Note that this entailment is compatible with a situation in which there were many people at the party. What matters is that none of the contextually salient alternatives to John came to the party, e.g. none of his class-mates, or none of his friends. That is to say that the domain of quantification over which the existential quantifier operates is determined pragmatically (or semantically, if a context anaphor is assumed; see von Stechow 1994 for such an approach which "syntactifies" and "semantifies" the contextual restriction). (2c) and (2c') are equivalent ways of stating the same entailment. If we apply this to the heavy-piano reading of (1), everything is fine and we correctly predict what is entailed to be false, namely "Two people can move the piano" and "One person can move the piano". According to (2c) the general statement of what is entailed is "There are no contextually salient numbers other than *three* such that this number of people can move the piano". (Note that numbers higher than three are disregarded because they result in alternative sentences that are trivially true.) The setting with the light-piano reading is trickier. Above we said that, in this context, (1) entails "No more than three people are needed to move the piano". (1) does entail this, but this entailment cannot be due to the use of *only*, because (1) without *only* likewise entails "No more than three people are needed to move the piano"; cf. (3).

- (3) *Three people can move the piano.*

To see more clearly what is really excluded by the use of *only* in the light-piano reading of (1) consider the following paraphrase.

- (1') *If there are only three people they can move the piano.*

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<sup>2</sup> I will not indulge in yet another discussion of whether presupposition, entailment or conventional/conversational implicature is the right notion to capture the semantic/pragmatic status of . (2) is an example.

(2b). A fairly recent comprehensive treatment of this classic problem can be found in Horn (1996). My interest concentrates on the entailment in . (2) is an example.

(2c/c')

Inasmuch as this paraphrase reflects the relevant meaning portions of the light-piano reading, it shows two things: (i) *only* in the light-piano reading does not have sentential scope because in the paraphrase (1') its scope is clearly confined to the *if*-clause, and (ii) since entailments are lost in protases, the *only*-entailment which the protasis of (1') would have as an independent sentence ("There are only three people" entails "There are no more than three people") does not hold for the whole conditional. Although the *only*-entailment is not truth-conditionally active with respect to the whole sentence, some non-trivial alternative proposition ("There are four people", "There are five people") must be contextually given. In our setting the client's wrong assumption introduces this proposition into the common ground, and although the calculation of alternatives takes place on a "sub-truth-conditional" level, the evaluational implicature going along with this calculation is surely felt to be present in the light-piano reading of (1): three people are less than expected. The fact that the entailment, but not the evaluational component, is hidden in cases analogous to the light-piano reading is taken by Jacobs as an argument in favour of his claim that both the quantificational component of meaning and the evaluational component form part of the lexical meaning of *only*-words and that either may be lost in special contexts. I take a different position here which derives the "neutralization" of the quantificational entailment from its truth-conditional inactivity in protases of conditional structures (which may be implicit), while the evaluational implicature is still triggered by the context. What I cannot discuss here is what syntactic consequences arise from the postulated propositional interpretation of the subject of (1) in the light-piano reading.

(1) has at least one more reading. This reading surfaces when we think of a very delicate piano which must be handled with greatest care. Only three people have received the right training, and only these three people can move the piano. Let us call this the delicate-piano reading. On this reading the subject is interpreted existentially ("There are only three people who can move the piano, namely Horst, Dieter and Charly"), and *only* takes scope immediately below the existential quantifier binding the indefinite subject.

Let us now turn to the translational equivalents of the English piano-sentence in Mandarin.

### 3. The Mandarin perspective: no lumping

In Chinese each reading of the English piano-sentence must be expressed in a univocal way.

- (4) a. The heavy-piano setting:  
*SÂN-ge rén cái bāndedòng zhè-jiâ gāngqín.*  
 3-CL person CAI can.move this-CL piano  
 ‘Only (as many as) THREE people can move this piano.’
- b. The light-piano setting:  
*Zh -yào SÂN-ge rén jiù/\*cái bāndedòng zhè-jiâ gāngqín le.*  
 only-need 3-CL people JIU/CAI can.move this-CL piano PRT  
 ‘Only (as few as) THREE people are needed to be able to move this piano.’
- c. The delicate-piano setting:  
*Zh y u SÂN-ge rén (\*cái) k y bāndòng zhè-jiâ gāngqín.*  
 only exist 3-CL people CAI can move this-CL piano.  
 ‘(There are) Only THREE people (who) can move this piano.’

Each of the Chinese sentences in (4) is limited to one setting, and the interesting question from the point of view of our investigation is whether we can account for the different focus readings in each case. At the same time the function of *cái* and *jiù* will be relevant to our discussion.

As laid out in detail in Hole (to appear [2000]), *cái* and *jiù* as in (4) relate to preceding foci (or contrastive topics). *Cái* goes hand in hand with an *only*-reading of the focus; in terms of quantification over focus alternatives this amounts to negated existential quantification. The focus quantificational type connected with *jiù* as in (4b) is negated universal quantification (Hole to appear [2000]: section 4.2): not all alternatives are true. More on this focus quantificational type will be said below. Let us now turn to the focus quantificational reasonings associated with each of the sentences in (4).

Consider (4a) first. The number word is in focus, and *cái* reflects the fact that the focus is intended as a focus excluding all non-trivial alternatives. The trivial alternatives are sentences with more than three people moving the piano: if three people can do the job, four or five people would do no harm, either. Thus only sentences with numbers lower than three are relevant, and all of them are excluded. No problems arise with this sentence, except for the fact that I have not been able to find a focus-marking device that could be used in front of the focus to ensure the correct reading other than contextual information (*cái* as a parametric word only reflects a type of focus quantification by way of an agreement mechanism; cf. Hole to appear [2000]: chapter 3)).

Let us skip (4b) for the moment and move straight on to the delicate-piano setting in (4c). In this sentence *cái* is ungrammatical even though all the excluded alternatives are non-trivial alternatives. The reason for the deviance of (4c) must thus lie elsewhere. I assume it lies in the syntax of the sentence. As reflected by the parenthesized translational option in English, the

Chinese sentence is really an existential sentence in which the predication starting with *k y* ‘can’ is functionally similar to a relative clause much as in the English translation which makes use of a cleft, i.e. it restricts the interpretation of *sân-ge rén* ‘three people’ such that (in our context) only the collection of Horst, Dieter and Charly is a possible value of the argument. (cf. Li 1996 for the discussion of different kinds of existential sentences in Mandarin; according to her classification (4c) is an Ind-type *y u* structure). If this is taken for granted, *y u* ‘exist’ is the matrix predicate of a complex sentence, and *k y* ‘can’ is embedded.<sup>3</sup> It is an independently established fact that parametric words attach to the syntactically superordinate predicates, and therefore *cái* may not be used before *k y* ‘can’ in (4c).

The Mandarin sentence for the light-piano setting is clearly trickiest. The status of *zh yào sân-ge rén* is the major problem for an analysis of (4b). With the facts concerning (4c) in mind one might aim at a complex-clause analysis, such that the sentence should be rendered as *Only three people are needed to be able to move this piano*. This is what (4b) means, but the syntax is different. The problem with *zh yào* is the following: (i) the necessity operator *yào* in *zh yào* is relevant for the interpretation, and this necessity operator takes wide scope with respect to other operators to its right; (ii) syntactically, *zh yào* does not take wide scope: in (4b) *zh yào* forms a constituent with the subject *w -ge rén* ‘five people’; it would be possible not to use *zh yào* at all without a change in the overall syntax of the sentence, and the meaning would not change, either. But even if we ignore the mismatch and say that *Only three people are needed to be able to move this piano* is a good paraphrase it is still not immediately clear why *jiù* is used in (4b), and why *cái* must not be used.

I will try to give a step-by-step account of the matter.

First let us think about what we would predict the meaning of (4b) to be if *zh yào* were not used. This case is illustrated in (4b’).

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<sup>3</sup> It is tempting to identify the sequence *zh y u* ‘only exist’ in (4b) with the bisyllabic *only*-word *zh y u* which is used before non-verbal categories and as a subordinator in *only-if*-clauses. This identification would be false. The sequence *zh y u* in (4c) is made up of two words; both words enter the semantic composition of the sentence separately. Formal proof of this comes from the possibility to drop *zh* in (4c): the resulting sentence would, as predicted, simply mean ‘(There are) three people (who) can move this piano’. In cases in which *zh y u* is used as a focus marker *zh* may not be dropped without influencing grammaticality; cf. (i) and (ii).

- (i) *Tā*      *\*(zh y u)*      *ZHÈ-zh ng*      *shù*      *cái*      *mǎi-guo*.  
 (s)he      only      this-CL:kind      book      CAI      buy-ASP  
 ‘(S)He’s only bought THIS kind of book before.’
- (ii) *\*(Zh y u)*      *TĀ*      *lái*      *w*      *cái*      *qù*.  
 only.if      (s)he      come      I      CAI      go  
 ‘Only if (S)HE comes will I go.’

- (4) b'. *SÂN-ge rén jiù bāndedòng zhè-jiâ gāngqín le.*  
 3-CL people JIU can.move this-CL piano PRT  
 '(As few as) THREE people are needed to be able to move this piano.'

This sentence can be taken to express what (4b) means, but it has slightly different entailments.

- (i) It asserts that three people can move the piano;
- (ii) it implies that four or five people would also be sufficient;
- (iii) the fact that *jiù* is used reflects the fact that the sentence is interpreted in such a way that not all relevant alternative sentences are true.

The last point is what matters here. If no relevant alternative sentence with numbers lower than 'three' is true, the focus interpretation stated in (iii) is still true. This is what makes (4b') apt to be used in the light-piano setting. But with a different context it is easy to see that the truth-conditions of (4b') are more liberal than those of (4b). Think of a context again in which you want to hire professionals to move your piano to another room. The company allows you to book either a single person, or three persons, but for some reason booking two people is impossible. You may ask: "How many people will be enough?", and the professional uses (4b') to answer your question. His answer leaves open the possibility that actually two people would already be enough to move your piano, but since a single person is not sufficient, and two people cannot be booked, he only gives you the three-people option. Using (4b') is not a lie, because *jiù* leaves it open (due to negated universal quantification over alternatives) whether two people would not be an option, too. I claim that our original sentence (4b) (repeated below for convenience) would amount to a lie if uttered in our context. Let us see how this comes about.

- (4) b. *Zh yào SÂN-ge rén jiù bāndedòng zhè-jiâ gāngqín le.*  
 only-need 3-CL people JIU can.move this-CL piano PRT  
 'Only (as few as) THREE people are needed to be able to move this piano.'

First consider what the necessity operator of *zh yào* adds to the meaning of the sentence. *Three people are needed to be able to move the piano*, that is the paraphrase of the assertion of (4b) including the necessity operator: no less than three people will do. This does go together with the focus interpretation reflected by *jiù* because the extreme case of negated universal quantification over the domain of alternatives is negated existential quantification; it does not go together with our new context, though: the necessity operator makes it clear that three people moving the piano are the borderline case. Being in need of three people

precludes the possibility that one would actually only need two. Therefore (4b) amounts to a lie in our context. The *only*-component of *zh yào* adds the (redundant) information that no more than three people are needed, and since this is redundant, the evaluational implicature, namely that three people are not much, has the field to itself.

Although I have not been able to solve the syntax-semantics puzzle posed by *zh yào*, the discussion of (4b) has shown the following. First, the semantics proposed by Hole (to appear [2000]) for *jiù*-sentences can handle such complicated cases. Second, if we compare the account given for (4b) and for its English counterpart in section 2, we must state that the match between the two sentences is highly indirect. I have proposed above that (5a) in its light-piano reading is interpreted like (5b).

- (5) a. *Only THREE people can move the piano.*  
b. *If there are only THREE people they can move the piano.*

As we know, the English paraphrase of the Mandarin version is more like (6).

- (6) *Only three people are needed to be able to move the piano.*

Paraphrased in terms of a semantics for conditionals in the spirit of the Lewis/Kamp/Heim/Kratzer tradition (Lewis 1975, Kamp 1981, Heim 1982, Kratzer 1991), (5b) comes out as (5').

- (5') The English light-piano reading  
All situations in which there are only three people are also situations in which the piano can be moved. [i.e. '∀... [...*only*...]restrictor, [POSS...]nuclear scope']

A paraphrase of (6) that is more explicit in terms of scope facts to cover the Mandarin sentence can be found in (6').

- (6') The Mandarin light-piano sentence  
It is only true of the amount of people 'three' that it is necessary to have this number of people in a situation in which the piano can be moved.  
[i.e. '*only* ... (NEC... (POSS...))']

I will not try to show how precisely the translational equivalence can be derived. My purpose here has been to illustrate that translational equivalence does not mean that the source sentence and the target sentence have identical logical forms.

#### 4. Conclusions

This paper has demonstrated that ambiguities of the piano-moving kind, which consistently arise in English and other European languages, do not exist in Mandarin because the system of focus-background agreement encoded by parametric words such as *cái* and *jiù*, and certain structural peculiarities of Mandarin existential sentences and *zh yào*-sentences, conspire to yield univocal sentences. The exact matching of the syntax of *zh yào* with its semantics remains as a challenge for future research.

## 5. References

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