

FLAVORS OF SCALAR LOWNESS*

ALEXANDER WIMMER
Universität Tübingen

1 Introduction

Mandarin *jiu* and German *schon* are two scalar particles sharing a considerable overlap of uses, referred to as ‘flavors’ in this paper’s title. Both often translate as ‘already’, and both can be thought of as conveying lowness on a scale in some way. As a starting point, *jiu*’s and *schon*’s scalar lowness may be best exemplified by their **temporal** uses, exemplified in (1). Scalar lowness surfaces as **earliness** here. In (1), *jiu* and *schon* each imply that it’s raining earlier than expected, or, to be more precise, that the speech time t_{now} is an early time for rain to be falling.¹

- (1) a. Ganggang haishi qingtian. Xianzai **jiu** xia yu le.²
just-now still clear-sky now **jiu** fall rain ASP
b. Eben hat noch die Sonne geschienen. Jetzt regnet es **schon**.³
just-now has still the sun shone now rains it **schon**
‘Just a moment ago, the sun was still shining. Now it’s already raining.’

~> t_{now} is an *early* time for rain to be falling

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¹ There is also an ‘inception’-implication that it didn’t rain before t_{now} (Lai 1999 on *jiu*, Löbner 1989 on *schon*), and an ‘additive’ implication that rain will keep falling after t_{now} . Both implications arise with the conditional examples in (2) as well, see footnote 6. They are discussed a bit in Wimmer (2020), section 4.4.

² Taken from bilingoal.com, 2019/07/14.

³ Taken from Zimmermann (2018).

Conditional uses of the two particles exemplify the ease with which scalar lowness translates into **minimal sufficiency (MS)**,⁴ a term that to my knowledge was coined by Grosz 2012: Placed in the consequent of a conditional, *jiu/schon* signal the antecedent *p* to be low in some relevant sense. This may be temporal earliness like above, but it can also be, say, the little *effort* it takes to smile in the case under consideration.⁵ The meaning that arises is that a smile from the hearer (*p*) *minimally* suffices for the speaker to be happy (the consequent *q* to become true).⁶

- (2) a. Ni xiao, wo **jiu** kaixin.⁷
you smile I **jiu** happy
- b. Wenn du lächelst, bin ich **schon** glücklich.
if you smile am I **schon** happy
≈ ‘Your smile is the little it takes for me to be happy’
- ~> **it takes as little as your smile to make me happy**

These are the core facts to be tackled in this paper. At the heart of the proposal is an LF-operator **LOW** that *jiu/schon* are both taken to spell out (a working hypothesis to be refined). The paper is organized as follows. Section 2 establishes an underspecified semantics for **LOW**, on which the latter presupposes scalar lowness of its only argument on a contextually salient scale. This analysis is applied to both the temporal and the conditional examples. Section 3 takes into account two co-occurrence patterns that Hole (2004) presents to support his view of *jiu* as a semantically vacuous agreement marker. Such patterns suggest a refinement of the view put forth in section 2, to the effect that *jiu* no longer spells out **LOW**, but agrees with an instantiation thereof, be it overt or covert. Section 4 reviews some previous work on *jiu* and *schon*, especially Krifka’s (2000) view that *schon* presupposes scalar highness, which is the exact opposite of what is assumed here. Section 5 concludes the paper.

2 LOW

This section introduces a type-flexible operator **LOW** and shows how it captures the meaning contributions of both *jiu* and *schon* in both their temporal and conditional uses. Similar to

⁴ Abbreviations used in this paper, including those appearing in glosses, are the following:

ASP = aspect marker

FA = Function Application

MS = minimal sufficiency

PRT = particle

PSP = presupposition

⁵ This is to follow Liu (2017), who assumes an effort scale for a *jiu*-sentence he discusses.

⁶ These examples, too, give rise to the inception- and the additive implication noted in footnote 1: Inception is implied in the sense that anything *less* than a hearer-smile is not enough to make the speaker happy. Additivity is implied in the sense that anything *more* than a smile from the hearer makes the speaker at least as happy as the smile itself.

⁷ Thanks to Zhuo Chen for a variant of this example.

Grosz's (2012) MS-ONLY, LOW is an identity function presupposing its only argument to rank low on a scale. At least for the time being, both *jiu* and *schon* are taken to spell out LOW.

LOW takes a single subclausal argument x of an underspecified semantic type σ ,⁸ and presupposes x to rank lowest on a salient scale among all members in C , a set of contextual alternatives including x itself. This is essentially the presupposition (PSP) Liu 2017 assumes for *jiu* and the exact opposite of the one Krifka (2000) assumes for *schon*. At the truthconditional level, LOW just vacuously returns x , i.e., has the semantic type $\langle\sigma,\sigma\rangle$.

- (3) $\text{LOW}_C(x_{\langle\sigma\rangle})$ is defined iff $\forall y \in C : (y \neq x) \rightarrow (x <_C y)$.
If defined, then $\text{LOW}_C(x) = x$.

In prose:

- (4) $\text{LOW}_C(x)$ is defined iff for all y in C : if y isn't x , then x is lower on a contextually salient scale than y .
If defined, then $\text{LOW}_C(x)$ is x .

A treatment of *jiu* and *schon* in terms of scalar lowness is not unprecedented in the literature. Long before Liu (2017), Lai (1999) has put forth a convincing account of *jiu* along these lines, including an application to temporal and conditional uses. von Stechow (2006) pursues a scalar lowness account of *schon*, pace Krifka's (2000) scalar highness account. For a somewhat more detailed review of previous work on the two particles, see section 4.

It is still unclear what the source of the alternatives is that *already*, *jiu* and *schon* work with. Given the present proposal, this question carries over to LOW. Its alternatives in (3) may or may not come from focus on x . *jiu*'s focus-sensitivity seems quite uncontroversial (Hole 2004, 2006, Liu 2017). Krifka (2000) and Ippolito (2007) treat *already* as focus-sensitive as well. But Beck (2019*) considers *schon* to be discourse-anaphoric rather than focus-sensitive, in analogy to her treatment of *still* and its German counterpart *noch* in Beck (2019). Grosz (2012) also argues *schon* not to be focus-sensitive. The example he gives looks something like the following.

- (5) a. Is it OK for two people to enter the boat?
b. Nein, denn dann wird es schon sinken.
no since then will it schon sink

The point Grosz makes with this example is based on the assumption that a focus-sensitive item requires an element bearing prosodic stress in its scope. The only candidate for such an element is the anaphoric particle *dann* 'then', which replaces the conditional antecedent *if 2 people enter the boat* whose alternatives vary along the numeral 2. But *dann* cannot be stressed in this case. Grosz concludes that the alternatives for *schon* are not induced by focus, but to be freely retrieved from the context in pretty much the same way as contextual restriction on quantifying expressions is standardly taken to function (von Stechow 1994).

An analogous example to (5) can be constructed with *jiu*:

⁸ Thanks to Doris Penka for bringing this notational tool to my attention. σ is a variable over semantic types, a flexibility we need to capture both the temporal and the conditional uses.

- (6) a. Is it OK for two people to enter the boat?
 b. Bu xing, zhe-yang ta jiu yiding hui chen.
 not ok this-way it jiu definitely will sink

Following Grosz, we may tentatively conclude from (5) and (6) that LOW's alternatives are not focus-induced.

Another debatable assumption is that *jiu* directly spells out LOW just as *schon* does. This works at least for the examples in (1) and (2). A challenge to this view comes from co-occurrence facts involving *jiu* (Hole 2004). This will lead us to loosen the tie between *jiu* and LOW in section 3. But the next goal is to show how LOW captures the two examples we started out with.

2.1 Capturing Earliness

It was noted above that in their temporal use, *jiu/schon* convey earliness. The *schon*-sentence (1) repeated from above serves as a reminder.

- (7) Jetzt regnet es **schon**.
 now rains it **schon**
 ~> t_{now} **is an early time for rain to be falling**

In this case, a temporally flavored version of LOW is at work. Let this variant be called $\text{LOW}_{\text{TEMP(ORAL)}}$. Its single argument is a time argument t of type $\langle i \rangle$, the type for times; by consequence, LOW_{TEMP} is of type $\langle i, i \rangle$. Under such a choice of argument, a temporal scale is evoked, and lowness becomes earliness. LOW_{TEMP} presupposes t to be the 'lowest', that is, earliest, time in C , a set of contextually salient times. If this earliness-PSP is satisfied, LOW_{TEMP} returns t .

- (8) $\text{LOW}_{\text{TEMP } C}(t_i)$ is defined iff $\forall t' \in C : (t' \neq t) \rightarrow (t <_C t')$.
 If defined, then $\text{LOW}_{\text{TEMP } C}(t) = t$.

It was decided above not to treat LOW as focus-sensitive. This comes in handy in the temporal cases considered here: If LOW_{TEMP} were focus-sensitive, its argument t would be focused. But in (7), prosodic focus doesn't fall on the temporal adverbial *jetzt* 'now'. A focus semantic account would have to assume covert focus on t , which is what Ippolito (2007) does in her analysis of what she refers to as aspectual *already*. The present account doesn't have to defend itself against skepticism pertaining to covert focus.

That being said, we can convince ourselves how the earliness-implication in (7) can be derived based on the semantics in (8). A strongly simplified LF for both (7) and its Chinese counterpart looks as in (9):

- (9) [$\text{LOW}_{\text{TEMP } C} t_{\text{now}}$] $\text{rain}_{\langle i, i \rangle}$

Based on (8), (9) presupposes t_{now} to be the earliest rain-time in C. This captures the earliness-implication. Rain is predicated over t_{now} in the assertion via *Function Application* (FA; Heim & Kratzer 1998). Both meaning components come from LOW_{TEMP} as defined above. Assertion and PSP together imply t_{now} to be an early time for rain to be falling.

- (10) [[(9)]] is true iff $[\lambda t. \text{rain}(t)](t_{\text{now}})$; ‘it’s raining’
 defined iff $\forall t' \in C : (t' \neq t_{\text{now}}) \rightarrow (t_{\text{now}} <_C t')$.

Something needs to be said about the contextually salient times in C. The speech time need not be the earliest time in the context, quite the contrary. Consider again (7), in whose longer version in (1) an even earlier time is made salient before *schon* is used. In the following paraphrase of (1), *already* stands for both *jiu* and *schon*.

- (11) Just a moment ago, the sun was still shining. Now it’s **already** raining.

So C includes a time preceding t_{now} :

- (12) $C = \{\text{shortly before } t_{\text{now}}, \mathbf{t_{\text{now}}}, \dots\}$

The present conception of LOW as implemented in (8) follows Liu (2017) in making the argument time the *earliest* time in the context. In other words, our analysis seems to wrongly predict the PSP in (10) to be violated in (11). But (11) doesn’t cause a serious problem if we follow Krifka (2000) in taking *schon* – and, more generally, LOW – to impose “a certain restriction on the alternatives”, leading the hearer to consider only the ones satisfying this restriction (Krifka 2000: 404): On this view, the earliness-component in (10) does not require C to contain no time preceding t_{now} . What happens instead is that *already* actively shapes C, signaling the hearer to ignore such earlier times. This comes in handy for the present analysis even though it seems to defy a strict view of PSP as a constraint on the preceding context, an issue I leave as a loose end.

2.2 Capturing Minimal Sufficiency

It was noted above that when *jiu* and *schon* appear in a conditional consequent q, they evaluate the antecedent p as low on a scale; see (2) repeated as (13) below. The resulting reading is that p *minimally suffices* for q to become true. With Liu (2017), the scale may be specified as one of effort, narrowing down lowness to easiness.

- (13) Wenn du lächelst, bin ich **schon** glücklich.
 if you smile am I **schon** happy
 ~> **it takes as little as your smile to make me happy**

What does a conditional variant of LOW look like? If indeed the whole antecedent is evaluated, the single argument of $\text{LOW}_{\text{COND(ITIONAL)}}$ has to be a proposition. This is spelled out in (14). The single argument p is the antecedent, whose type $\langle s, t \rangle$ is written as $\langle p \rangle$. Aside from this specification, LOW_{COND} works in the by now familiar fashion: p is presupposed to be the lowest proposition in C.

- (14) $\text{LOW}_{\text{COND } C}(p_p)$ is defined iff $\forall p' \in C : (p' \neq p) \rightarrow (p <_C p')$.
If defined, then $\text{LOW}_{\text{COND } C}(p) = p$.

In (15) I follow suggestions by Sigrid Beck and Doris Penka (pc) in having LOW_{COND} combine with p at the very top of LF. p has undergone movement, leaving a propositional trace in its launching site. It is abstracted over right above the conditional, a mechanism that creates a function taking a proposition as argument.⁹

- (15) $[_S' \text{LOW}_{\text{COND } C} [\text{that you smile}]] [_{S''} \lambda p [\text{if } t_{<p>, I'm happy}]]$

(15) is interpretable as follows. A smile from the hearer is asserted to make the speaker happy. Again via FA, the proposition-taking function denoted by S'' combines with the proposition *that you smile* denoted by S' . LOW_{COND} presupposes that same proposition to rank lowest in C .

- (16) $[[(15)]]$ is true iff $[\lambda p. \text{if } p, I'm \text{ happy}](\text{you smile})$; ‘if you smile, I'm happy’
defined iff $\forall p' \in C : (p' \neq [\text{you smile}]) \rightarrow ([\text{you smile}] <_C p)$.

LOW_{COND} evaluates a proposition p as low. It probably doesn't come as a big surprise that this lowness can be untangled from logical strength, given the wellknown existence of nonlogical scales in the semantic literature.¹⁰ This becomes clear if we think of possible choices for C , keeping in mind the notion of easiness evoked above. p 's easiness may well coincide with its logical weakness, as seen in (17), where p is in bold face. In this case, p 's alternatives are not only harder to put into action than p , but also asymmetrically entail p .

- (17) $C1 = \{\text{you smile}, \text{you smile \& dance}, \text{you smile \& dance \& play the harp}\}$

But easiness can well do without logical weakness. Another plausible choice for C is (18), where p can easily be thought of as ranking as easiest without being entailed by any of its alternatives. The hearer may have an easier time smiling than baking a cake or taking the speaker to Paris, but she may well be looking deadly serious while performing any of these two alternative actions.

- (18) $C2 = \{\text{you smile}, \text{you bake a cake}, \text{you take me to Paris}\}$

⁹ Propositional traces are ruled out by Poole's (2017) *Trace Interpretation Constraint*, on which traces can only be of a simple type such as $\langle e \rangle$. On the other hand, they are not unprecedented in the literature: For example, a propositional trace plays a role in Beck's & Rullmann's (1999) analysis of the sentence *John knows where you can buy the New York Times*. An alternative to the present analysis of MS-conditionals is offered by the view of *conditionals as definite descriptions* (Schlenker 2004, Stalnaker 1980 a.o.). On this view, antecedent clauses denote the single closest world(s) in which the antecedent p holds true, $[t_w: p(w)]$. The consequent q is predicated over that single p -world via FA, $[q(t_w)]$. Conditional LOW would then combine with that single world, and q would apply to the result of that combination $[q(\text{LOW}(t_w))]$. This alternative draws appeal from its simplicity: For one thing, temporal and conditional LOW would be more parallel, the former having type $\langle i, i \rangle$, the latter $\langle s, s \rangle$. For another, no raising of the antecedent would have to be assumed.

¹⁰ Thanks to Yimei Xiang and Yenan Sun for discussion on this topic. It is crucial for Liu's (2017) *jiu*-analysis that scalar lowness is independent from logical weakness.

A final note on *p* ranking lowest as encoded in the semantics of LOW_{COND} . As seen above, temporal *schon* felicitously applies to a time *t* even if the context provides times that are earlier than *t*. Analogously, conditional *schon* doesn't disallow for the saliency of a proposition that is even easier to put into action than *p*. Consider the following monologue, supposing that it's easier for the hearer to sulk than to smile:

- (19) a. Every time you look sulky, I'm pretty unhappy.
 b. Doch wenn du lächelst, bin ich schon glücklich.
 yet if you smile am I schon happy

Again, this is harmless under Krifka's (2000) view that *schon* allows and even requires us to ignore certain alternatives, in this case any action that is easier for the hearer to perform than a smile.

2.3 Section Summary

The aim of this section was to show how temporal and conditional *jiu/schon* can be treated as different variants of one and the same semantic operator LOW , an identity-function ranking its single argument as lowest on a scale. Lowness translates into earliness in the temporal uses, and MS in the conditional ones.

3 Lowness as Agreement¹¹

Up to this point, *jiu* and *schon* have somewhat naïvely been treated on a par in the sense that they have each been taken to spell out an LF-operator LOW . But Hole (2004) gives reason to loosen the tie between *jiu* and LOW somewhat, identifying two items that necessitate *jiu*'s insertion close before the sentence predicate:¹² the conditional subjunctive *zhi-yao* 'only-need' and the particle *guang* 'alone', both of which contribute MS in (20).

- (20) a. **Zhi-yao** ni xiao, wo *(**jiu**) kaixin.
only-need you smile I *(**jiu**) happy
 ≈ 'You only need to smile for me to be happy.'
 b. **Guang-shi** xiang *(**jiu**) ling ren haipa.¹³
alone-be think *(**jiu**) make people afraid
 'The very thought is frightening.'

These patterns motivate Hole's treatment of *jiu* as a semantically vacuous agreement marker that merely *reflects* pre-established quantification over alternatives, a view shared by Tsai (2017). In the given cases, the actual quantifiers are *zhiyao* and *guang*, respectively. Refining the

¹¹ Title inspired by Lee's (2005) paper on Korean *man* 'only', which is taken to agree with a covert $ONLY$ -operator. This proposal is likened by Beck (2007) to Hole's for *jiu* and other Mandarin particles, and has recently been applied to English *only* by Quek & Hirsch (2016).

¹² It seems safe to adopt Hole's (2004) characterization that *jiu* occurs right before what he calls the *predicative complex*.

¹³ Taken from LINE dictionary, 2019/01/11.

present account accordingly, this means that scalar lowness (and more narrowly: MS) actually comes from these two items, not from *jiu* itself.

The German variants of the sentences in (20) are given in (21). *schon* is preferred if an MS-reading is intended, see Grosz (2012) on the particle's disambiguating effect on sentences like (21a). But by no means is it ungrammatical to leave it out.

- (21) a. Wenn du nur lächelst, bin ich (schon) glücklich.
if you only smile am I (schon) happy
b. Allein (schon) der Gedanke ängstigt mich.
alone (schon) the thought scares me

Based on the patterns in (20), the present section refines the view put forth in the preceding section: *jiu* doesn't spell out LOW, but merely agrees with it, i.e., indirectly reflects its presence. In the remainder of this section, *guang* and *zhiyao* are analyzed as overt instantiations of LOW. But before that, I will try and make the potential agreement mechanism seen in (20) a bit more precise.

From a Minimalist viewpoint (Chomsky 1995), the idea that *jiu* is in agreement with LOW can be modeled as follows. Being semantically contentful, LOW carries an interpretable lowness-feature [iLOW], and *jiu* its uninterpretable counterpart [uLOW]. The structural configuration underlying the two examples in (20) is as in (22).

- (22) [LOW_[iLOW] X] [... jiu_[uLOW] ...]¹⁴

If LOW is not spelled out, it still needs to be posited at LF. This follows from Brody's (1997) *Principle of Radical Interpretability*, on which every uninterpretable feature needs to have an interpretable counterpart. A *jiu*-sentence lacking overt LOW still contains an [iLOW], carried by a phonetically empty head \emptyset :

- (23) [\emptyset _[iLOW] X] [... jiu_[uLOW] ...]

We can take a configuration like (23) to underlie the two *jiu*-sentences from (1) and (2), repeated in (24). In both cases, *jiu* is not preceded by any overt lowness-conveying element:

- (24) a. Xianzai jiu xia yu le.
now jiu fall rain ASP
b. Ni xiao, wo jiu kaixin.
you smile I jiu happy

Based on the schema in (23), these two sentences can be given structures like the following.

- (25) a. [\emptyset _[iLOW] now] [jiu_[uLOW] fall rain] (24-a)
b. [\emptyset _[iLOW] [i you smile]] [[MUST t_i] I jiu_[uLOW] happy] (24-b)

¹⁴ This is reminiscent of so-called *Spec(ifier)-head agreement*. Hole (2017) proposes such an analysis for a similar construction involving the Mandarin particle *cai*, but see Sun (2019) for concerns. I leave it open whether or not the sentences in (20) fall under this type of agreement.

What is still unclear at this point is *jiu*'s obligatory insertion in the presence of *zhiyao* and *guang* in (20). One potential solution is opened up by Pesetsky & Torrego's (2007) (P&T's) classification of features along two dimensions that had previously been treated on a par: interpretability and valuation. The classic view they argue against is that an [iF] is lexically valued, while a [uF] is not. P&T's system allows there to be unvalued [iFs] and valued [uFs]. *jiu*'s obligatoriness following overt LOW is less puzzling if we think of LOW's [iLOW] as unvalued and of *jiu*'s [uLOW] as valued. An unvalued feature needs to be valued by a matching valued feature; this may capture the incompleteness-effect that arises when *zhiyao* or *guang* are not followed up by *jiu* in the same sentence.

The syntactic details are left to future research. It should be noted though that things may well be different from how they are presented here. This is suggested by an assumption underlying both Hole's (2017) and Sun's (2019) treatments of the ONLY-particle *cai*. The latter appears in similar co-occurrence patterns as *jiu*; in the following example from Hole (2017), *cai* obligatorily follows *zhiyou* 'only'.

- (26) Akiu zhiyou niurou *(cai) chi.
 Akiu only beef *(cai) eat
 'Akiu only eats beef.'

While their accounts differ, Hole and Sun both assign the [iF] to *cai*, and the [uF] to *zhiyou*. If we were to apply this to *jiu*, we would have to treat *jiu* as carrying the [iF], contrary to what is assumed here.

With a rough idea of what agreement between LOW and *jiu* may look like, let us now turn to the promised analysis of *guang* and *zhiyao* as overt variants of LOW.

3.1 *guang* 'alone'

Recall (20-b), with *guang* inside the subject:

- (27) Guang-shi xiang *(jiu) ling ren haipa.
 alone-be think *(jiu) make people afraid

In this case, *guang* may instantiate an <e,e>typed version of LOW, presupposing an individual *x* to rank lowest on a given scale:

- (28) $LOW_{IND(INDIVIDUAL) C}(x_e)$ is defined iff $\forall y \in C : (y \neq x) \rightarrow (x <_C y)$.
 If defined, then $LOW_{IND C}(x) = x$.

LOW_{IND} , spelled out as subject-internal *guang*, carries an interpretable lowness-feature [iLOW]. *jiu* agrees with LOW_{IND} in virtue of carrying the uninterpretable counterpart [uLOW].

- (29) [$LOW_{IND [iLOW]}$ think] $jiu_{[uLOW]}$ scary

At LF, LOW 's first argument *think* undergoes type-shifting from a predicate to an individual that amounts to something like 'the act of thinking' and will henceforth be referred to as 'the

thought'. This is to apply Partee's (1986) *iota-shift*. In the LF below, this shift is performed by an $\langle et, e \rangle$ -type iota operator ι attached to *think*. *jiu* does not enter semantic computation, given its assumed vacuity.

(30) [LOW_{IND C} [ι think_{e,t}]] (*jiu*) scary_{e,t}

Inspired by Coppock & Beaver (2014), who tackle the very similar sentence *just the thought of him sends shivers down my spine*, the alternatives in C can be thought of as different degrees of perceived intensity regarding some salient entity x. Let x be an encounter with a grizzly bear. The mere thought of having such an encounter is conceivably less intense than the actual encounter. In a context like this, the alternatives in C can be informally described as follows:

(31) C = { **the thought of the encounter**, the actual encounter }

(30) presupposes the thought to be less intense than all other things in C, that is, the actual encounter. On the level of assertion, we simply get that the thought is scary.

(32) [[(30)]] is true iff scary'(ιz :thought'(z));
defined iff $\forall y \in C : (y \neq [\iota z$:thought'(z)]) \rightarrow ([ιz :thought'(z)] $<_C$ y).

It has to be noted that *guang* also has exclusive readings, as seen in (33), with *guang* attached to the verb.

(33) Ta *guang* shuo, bu zuo.¹⁵
he alone talk not do
'He just talks, but doesn't act.'

This exclusive reading, absent in (27), is 'activated' when the sentence is negated (34). The lowness-evaluation still persists, but negation targets an exclusive interpretation of *guang*. If (34) were just the negation of (27), the thought would be implied not to be scary. What we get instead is the additive meaning that aside from the thought, something other than it is scary too, which is why (34) is not that dissimilar in meaning from (27). Along with this interpretive effect, *jiu*, which is obligatory in (27), makes (34) ungrammatical.

(34) Bu *guang*-shi xiang (**jiu*) ling ren haipa.
not alone-be think (**jiu*) make people afraid
~> the thought is not much [lowness]
~> \neg (nothing but the thought is scary) \equiv something other than the thought is scary

It seems from (33) that under negation, subject-internal *guang* doesn't just carry [iLOW], but also an exclusion feature [iEXCL].

The examples in (27), (33) and (34) raise three puzzles which at least partially touch on the more general question when and how exclusive particles come to have an MS-reading. P1 and P2 more narrowly pertain to the contrast between (34) and (27).

¹⁵ Taken from LINE Dictionary, 2019/04/03.

- P1: Why is subject-internal *guang* exclusive under negation?
- P2: Why is *jiu* a bad match for exclusive *guang*?
- P3: Can exclusive and MS-uses for *guang* be derived from the same lexical entry?

P1 and P2 are left as puzzles here. As for P3, there are proposals on the market that derive cases analogous to (27) via typeshifting, keeping an exclusive contribution confined to NP (Coppock & Beaver 2014, Coppock & Lindahl 2014, Liu 2016).¹⁶

3.2 *zhi-yao* ‘only-need’

Compared to subject-internal *guang*, the complex conditional subjunction *zhiyao* seems a bit harder to treat as a variant of LOW: By definition, the latter takes just a single argument, while *zhiyao* seems to take two. In this section, a potential solution is offered by a decompositional approach to *zhiyao* considered by Sigrid Beck (pc). As in the previous section on *guang*, we are faced with the issue of MS-readings for exclusives.

At first glance, *zhiyao* appears to be a conditional operator encoding MS. To see this, let’s reconsider (20-a), repeated as (35). This sentence can be paraphrased as ‘your smile is the little it takes for me to be happy’.

- (35) *Zhi-yao ni xiao, wo *(jiu) kaixin.*
 only-need you smile I *(jiu) happy

Let us first see what treating *zhiyao* as a conditional operator would amount to. In the LF below, *zhiyao* is represented as ONLY-NEED, an operator that carries an interpretable lowness feature [iLOW] and takes two propositions as its arguments, an antecedent *p* and a consequent *q*. *jiu*, which sits in the sentence part denoting *q*, agrees with ONLY-NEED in virtue of carrying [uLOW].¹⁷

- (36) [ONLY-NEED_[iLOW] [_p you smile]] [_q I *jiu* _[uLOW] happy]

On this analysis, *jiu* stands in a similar structural relation to ONLY-NEED as it does to subject-internal *guang*: In both cases, the overt operator *O* with the [iLOW] first combines with an element *x* that neither contains *jiu* nor is identical to it. When *O* is ONLY-NEED, *x* is *p*.

- (37) [*O*_[iLOW] *x*] ... *jiu* _[uLOW] ...

A possible semantics for ONLY-NEED is given in (38). Its semantics deviates only slightly from that for the necessity modal MUST that, on the so-called *restrictor approach*, is taken to be at play in conditionals, see von Stechow & Heim (2011) for an introduction. Like MUST, ONLY-NEED as defined in (38) takes two propositions (sets of possible worlds), *p* and *q*, and asserts *p*

¹⁶ Thanks to Danny Fox (pc) for discussion of this concept. Coppock & Lindahl (2014) and, more recently, Panizza & Sudo (2020) explore the conditions under which subject-internal *just* has an MS-reading. Interestingly, subject-internal *guang* always seems to have an MS-reading in positive syntactic environments.

¹⁷ Such a view resembles Tsai’s (2017), who argues *jiu* to (sometimes) reflect an MS-operator ONLY HAVE TO.

to be a subset of q , that is, all p -worlds to be q -worlds.¹⁸ Put informally, **MUST** asserts p to *suffice* for q . **ONLY-NEED** distinguishes itself from ‘bare’ **MUST** in presupposing p to rank lowest on a scale, a PSP shared with LOW_{COND} in section 2.2. Taken together, PSP and assertion of **ONLY-NEED** convey p to *minimally* suffice for q .

- (38) $\text{ONLY-NEED}_C(p)(q)$ is defined iff $\forall p' \in C : (p' \neq p) \rightarrow (p <_C p')$.
If defined, $\text{ONLY-NEED}_C(p)(q)$ is true iff $p \subseteq q$, i.e., $\forall w : p(w) \rightarrow q(w)$.

The problem posed by (38) is that **ONLY-NEED** does not fit the semantic type we’ve assigned to **LOW**, and hence cannot be taken to instantiate the latter without further ado. **LOW** was defined as taking a single argument. **ONLY-NEED**, however, takes two arguments. So as things stand, **ONLY-NEED** is not an exact instantiation of **LOW**.

This problem is solved under a decompositional approach to **ONLY-NEED** suggested to me by Sigrid Beck (pc). On this approach, it is just the **ONLY**-part of **ONLY-NEED** that carries $[\text{iLOW}]$; **NEED** independently acts as the conditional operator. In close analogy to the analysis of *jiu*-conditionals without *zhiyao* pursued in section 2.2, p raises above **NEED** to combine with **ONLY** on top of LF:

- (39) $[\text{ONLY}_{[\text{iLOW}]} p] [\lambda p [[\text{NEED } t_{<p>}] \dots \text{jiu}_{[\text{uLOW}]} \dots]]$

It is intuitively clear that between **ONLY** and **NEED**, the former is more likely to carry an $[\text{iLOW}]$ than the latter. Evidence that *zhi* ‘only’ is indeed a scalar kind of **ONLY** is suggested by (40), which varies on an example in Hole (2004).

- (40) **Wo zhi** shi yi-ge fuwuyuan.
I **only** be a-CL waiter
‘I’m just a waiter.’
~> a waiter is low in rank [lowness]

Little surprisingly, *zhi* also leads an existence as an exclusive particle. In (41) (with object focus indicated by a subscript F), an attempt at denying the exclusive contribution of *zhi* leads to inconsistency.

- (41) a. Yiting zhi pa-le [Bai Shan]_F.
Yiting only climb-ASP [White Mountain]_F.
b. # Ta ye pa-le [Huang Shan]_F.
she also climb-ASP Yellow Mountain

Under the decompositional approach taken in (39), we do not want **ONLY** to be exclusive. The truth conditions of the LF would read as ‘nothing other than p makes q true’. But this defies the MS-nature of sentences containing *zhiyao*, which convey that *at least* p makes q true, and alternatives to p are likely to make q true as well.

¹⁸ This is a blatant simplification in view of wellknown overgenerations, but one that should do given our purposes. The quantificational domain of conditional **MUST** needs to be restricted (at least) to worlds that are maximally similar to the actual world, see e.g. von Stechow (2011). Thanks to Daniel Margulis for pointing this out to me in the first place, and to Doris Penka for further discussion.

But, as has been mentioned before, Grosz (2012) assumes there to be two kinds of ONLY, an exclusive and a nonexclusive variant, henceforth referred to as MS-ONLY. He assumes the latter to be at play in a German MS-conditional like the following.

- (42) Wenn nur zwei_F Leute kommen, spielen wir schon Siedler.
 if only two_F people come play we schon Siedler
 ≈ ‘It only takes 2 people for us to play Siedler’

Both ONLYs convey scalar lowness, but only one of them is exclusive. (43) follows Grosz in describing this observation.

- (43) exclusive ONLY [+LOW, +EXCL]
 MS-ONLY [+LOW, -EXCL]

MS-ONLY is an identity-function triggering a scalar lowness PSP regarding its prejacent p.

- (44) MS-ONLY_{[Grosz (2012)] C}(p) is defined iff $\forall p' \in C : (p' \neq p) \rightarrow (p <_C p')$.¹⁹
 If defined, then MS-ONLY_{[Grosz (2012)] C}(p) = p.

In the version stated in (44), MS-ONLY is semantically equivalent to LOW_{COND} from section 2.2. So the ONLY in (39) can only be MS-ONLY. It carries [iLOW], but it carries no exclusive feature [iEXCL].

This sketch of an analysis for *zhiyao* raises at least two questions. First, it takes wonder why the exclusive variant of ONLY is blocked in a *zhiyao* -conditional. This again touches on a question that arose in connection with *guang* ‘alone’ above, namely how exclusives come to have MS-readings. von Stechow & Iatridou’s (2007; henceforth vF&I) decompositional take on *only have to* as in *to get good cheese, you only have to go to the North End* leaves ONLY exclusive.²⁰ Both *only have to* and *zhi-yao* ‘only-need’ are internally composed of ONLY and a necessity modal. This striking resemblance makes it tempting to pursue an analysis like vF&I’s, and leave *zhi* exclusive as well.

Second, the present analysis draws no semantic distinction between *jiu*-conditionals with *zhiyao* on the one hand and minimally different ones without it on the other. The type of *jiu*-conditional analyzed in section 2.2, repeated in (45-a), contained no conditional subjunction, and was assigned the LF in (45-b).

¹⁹ The PSP assumed by Grosz quantifies over *most* q in C, not *all* of them.

²⁰ Here is a rough sketch of vF&I’s account. In (i-a), ONLY decomposes into two parts, a negative \neg and an existential one \exists , which takes a proposition p and asserts some proposition other than p to be true. If we run into (i-b), ONLY takes surface scope above *only have to*, represented as MUST in (i-c). But while \neg stays in situ, \exists lowers under MUST. The resulting meaning can be paraphrased as ‘not in all properly restricted worlds [those in which you get good cheese] are worlds in which you do something other than p [going to the North End]’.

- (i) a. ONLY_C $\rightarrow \neg \& \exists_C$
 b. to get good cheese, you only have to go to the North End
 c. ONLY_C [MUST_{C'} [p you go to the NE]]
 $\neg [\exists_C [MUST_{C'} p]]$ [via (i-a)]
 $\neg [MUST_{C'} [\exists_C p]]$ [∃-lowering]

- (45) a. Ni xiao, wo jiu kaixin.
 you smile I jiu happy
 b. [LOW_{COND} [you smile]] [λp. if p, I'm happy]

In (45-b), pretty much the same ingredients are organized in exactly the same way as in (39). In both cases, the antecedent *p* is presupposed to be the lowest proposition in the context, and asserted to verify the consequent. If this parallel treatment were correct, the presence or absence of *zhiyao* would have no effect on the interpretation of a conditional with *jiu* in its consequent. It is possible, however, that *zhiyao* makes a subtle interpretive difference that the present account is insensitive to. More concretely, *zhi(yao)* may emphasize *p*'s lowness, which may be more weakly conveyed in (45-a). On the other hand, if we take into account the sometimes emphatic nature of agreement configurations (Zejlstra 2007), this kind of enhancement even speaks in favor of the present account rather than casting doubt on it: Lowness is ensured either way via *jiu*, it is just implied more strongly with *zhiyao* than without it.

3.3 Section Summary

This section spelled out Hole's (2004) treatment of *jiu* as a semantically vacuous agreement particle. *jiu* was endowed with an uninterpretable lowness-feature [uLOW]. Two MS-items, subject-internal *guang* 'alone' and the subjunction *zhi-yao* 'only-need', were endowed with the matching [iLOW]. More specifically, they were treated as spelling out nothing but the LOW-operator introduced in section 2. It was left open how they come to do so, in spite of being exclusive (*guang*) or having an exclusive as a building block (*zhiyao*). The existing proposals cited above may prove helpful at the very least as far as the derivational steps are concerned. A promising guideline is to see both exclusive and MS-cases as linked by a PSP of scalar lowness (Grosz 2012, Liu 2017). This provides a clear link to the semantics proposed for LOW here. Whatever the exact derivation looks like, this PSP survives.²¹

In addition to *guang* and *zhiyao*, there happens to be at least one other item *jiu* preferentially co-occurs with in a sentence: the temporal connective *yi* 'as soon as', expressing a "quick succession" between two events.²²

- (46) Women yi dao jia, tian ?(jiu) xia yu le.²³
 we once arrive home sky ?(jiu) fall rain ASP
 'Once we got home, it began to rain.'

Pursuing the approach taken in this section, we may want *yi* to be yet another item spelling out LOW:

- (47) ? [YI_[iLOW] [we get home]] sky jiu_[uLOW] rain

²¹ On a related note, the involvement of exclusives suggests a more flexible conception of LOW than the one entertained here so far. Exclusives are generally treated as focus-sensitive in the literature. LOW, by contrast, is described as focus-insensitive above, even though this doesn't play a role in its formal definition. So maybe this description is too restrictive, and LOW may actually be [\pm focus-sensitive].

²² This characterization can be found, for example, in the following entry of an online grammar: https://resources.allsetlearning.com/chinese/grammar/Events_in_quick_succession_with_%22yi..._jiu...%22 [2020/11/02].

²³ Taken from LINE dictionary, 2019/07/14.

But how is this possible? What YI seems to be doing is semiformaly stated in (48), where it takes two propositions p and q (conceived of as sets of times), picks out the earliest salient p -time t as well as the earliest salient q -time t' , and asserts t to immediately precede t' . In (46), p denotes a punctual event, so the p -time YI picks out is both the earliest and the latest p -time.

- (48) $YI_C(p_{i,t})(q_{i,t})$ is true iff
 t [t is the earliest p -time in C] $<$ t' [t' is the earliest q -time in C]
 ‘the earliest p -time in C immediately precedes the earliest q -time in C ’

Based on (48), we get the following interpretation for (46).

- (49) [[[YI_C [we got home]] sky rain]]
 is true iff t [t is the earliest time at which we arrived in C] $<$ t' [t' is the earliest time at which it rained in C]

If this is correct, it takes wonder if YI can still be held to instantiate [iLOW], and how. One possible way is opened up by the notion of immediacy figuring in the assertion: The temporal distance separating t from t' couldn't be any smaller. But it is plain to see that YI does not spell out LOW as conceived of throughout this paper: The former takes two arguments, the latter just one; the former has lowness in its assertion, the latter has it in its PSP. I take the case of *yi* to vaguely suggest that [iLOW] can be instantiated by operators that are different from LOW: Lowness doesn't have to be presupposed, but can also be asserted.

4 Previous Work on *jiu* and *schon*

A lot of work has been conducted on *jiu* and *schon*, some of which the present proposal is strongly inspired by. This section's purpose is to review some of these accounts just a little more closely.

4.1 *jiu*

Core aspects that the present account adopts from previous work on are the view that *jiu* comes with scalar lowness as well as its treatment as an agreement particle. Lowness views I am aware of are held by Lai (1999) and Liu (2017). The agreement view can be found in Hole (2004), but Tsai's (2017) more recent account is headed into a similar direction.²⁴ This brief section is centered around Hole's (2004) and Liu's (2017) accounts, both a major source of inspiration for the present account.

Liu's (2017) study is based on an ambiguity that has been neglected here so far. His key example is the minimal pair in (50), which shows *jiu* to be exclusive before an NP in focus (50-

²⁴ Tsai's (2017) as well as Zhang & Ling's (2017) proposals also link *jiu* to (minimal) sufficiency, a link that the present account reinforces. Tsai (2017) takes the particle to (sometimes) reflect an LF-operator ONLY HAVE TO, inspired by vF&I (2007). Zhang & Ling (2017) think of *jiu*'s sufficiency as discourse-related in the sense that it marks a sufficient answer to the *question under discussion*. Tsai's (2017) idea may be fruitfully combined with the syntax-semantics mapping Hole (2006) takes *jiu* and related Mandarin particles to mark, but this is left for the future.

a), and nonexclusive when it follows it (50-b), the latter being the type we have been concerned with so far. What connects both variants is an implication of scalar lowness.

- (50) a. Jiu Yuehan_F hui shuo fayu.
 jiu John_F can speak French
 ‘Only John can speak French.’
 ~> nobody but John can speak French [exclusive]
 ~> John stands for a *low* number of people [lowness]
- b. Yuehan_F jiu hui shuo fayu.
 John_F jiu can speak French
 ‘John can speak French.’
 ~> ~~nobody but~~ John can speak French [nonexclusive]
 ~> John is *easy* to get hold of [lowness]

Disfavoring lexical ambiguity for obvious reasons, Liu (2017) proposes *jiu* to be one and the same scalar ONLY in both cases: Its truth-conditions exclude logically stronger alternatives. The difference in meaning between (50-a) and (50-b) is ascribed to different alternatives. The ones for (50-a) differ in logical strength, leading *jiu* to reject all of them except for the prejacent that John can speak French. The ones in (50-b) are equally strong, so there is nothing to be excluded.²⁵

The present account tacitly returns to Hole’s (2004) view that the contrast in (50) is due to a lexical ambiguity, i.e., that exclusive and nonexclusive *jiu* exist independently. This may be seen as a drawback, but one reason to do so is the unified treatment of nonexclusive *jiu* and *shon* pursued here. Another are Hole’s (2004) agreement data, which can be taken to motivate a treatment of nonexclusive *jiu* as semantically vacuous. Even under an ambiguity account however, Liu’s proposal draws great appeal from implicitly telling a story how this ambiguity might have come about diachronically.

Hole’s (2004) earlier proposal is rather different from Liu’s (2017) in that it takes *jiu* to reflect a ban on universal quantification over focus alternatives, henceforth referred to as the $\neg\forall$ -constraint. More specifically, a *jiu*-sentence is taken to presuppose that there is at least one wrong alternative. A core example Hole argues to speak in favor of this view is the following.

- (51) a. Dong-ya ren dangzhong, ...
 East-Asia person among
 ‘Among East Asian people, ...’
- b. # ..., riben_F ren **jiu** zhang-zhe hei toufa.
 # ... Japanese_F person **jiu** grow-ASP black hair
 ‘..., the Japanese have black hair.’

²⁵ Moreover, Liu claims (50-b) to come with an ‘anti-exhaustive’ PSP: the existence of another French speaker may not be ruled out to begin with. This PSP is not ascribed to *jiu* itself, but to the *contrastive topic* configuration Liu takes (50-b) to be. This makes (50-a) and (50-b) contradictory on Liu’s account.

The argument goes like this: (51-a) restricts the domain of alternatives to East Asian people. *jiu* is infelicitous in (51-b) since according to a stereotypical worldview, all East Asians are black-haired. In other words, (51-a) indirectly violates the $\neg\forall$ -constraint.

Hole's semantics aligns nicely with the fact that *jiu* is often translated as *then*:²⁶ Iatridou (1993) proposes conditional *then* (*if p, then q*) to presuppose just what Hole says *jiu* does: there has to be some alternative to *p* that does not verify *q*. However, there are clear counter-examples to Hole's semantics.

Varying on (51) just a bit, *jiu* becomes felicitous even though the new context now explicitly violates the $\neg\forall$ -constraint:²⁷

- (52) a. Zai dongya li, suoyoude ren dou zhang-zhe hei toufa.
at East-Asia in every person dou grow-ASP black hair
'In East Asia, everyone is blackhaired.'
- b. Riben_F ren **jiu** zhang-zhe hei toufa.
Japanese_F person **jiu** grow-ASP black hair

This raises the suspicion that the infelicity seen in (51) is not rooted in the hypothesized $\neg\forall$ -constraint, but rather in the way the context is set up. It seems that (51-b) comes across as uttered out of the blue, and that the frame-setting adverbial in (51-a) doesn't suffice to set up a context.

In her review of Hole (2004), Tham (2005) makes a similar case against the $\neg\forall$ -constraint. (53-b), also an example from Hole (2004), is felicitous after (53-a), which it shouldn't be if the constraint obtained.

- (53) a. We can play anywhere.
b. Zai zher_F women jiu neng wanr.
at here_F we jiu can play

It might be on grounds like these that Liu (2017) considers the $\neg\forall$ -constraint to be an *implicature* rather than a PSP.

4.2 *schon*

The following discussion will be largely based on Krifka's (2000) idea that *schon* ranks a focus *highest* on a scale, which is the exact opposite of what the present account assumes. Zimmermann (2018) notes that under Krifka's view, *schon* is implicitly likened to *even*, which tends to be seen as evaluating its prejacent as *least likely*, hence as *most noteworthy*.

²⁶ A translation of *jiu* as 'then' also seems to apply in the following example, also from Hole (2004).

- (i) a. Old Wang got up at 6, took the bus at 6:30, and ...
b. ... ta qi dian jiu zai bangongshi le.
... he seven o'clock jiu at office ASP

As Daniel Hole (pc) has pointed out to me, such examples seem devoid of scalarity, challenging scalar *jiu*-accounts like the present one. I leave it open whether a scalar account can accommodate (i).

²⁷ It should be noted that one out of four informants I consulted on (52) disliked *jiu* there as well.

The subsection can be broken down into two parts. First, I will sketch Lai's (1999) and von Stechow's (2006) defense of scalar lowness for *jiu* and *schon*, respectively. This is followed by a few remarks on the similarity between *schon* and *even*. Some *jiu*-data will be considered along the way. Other highly relevant accounts of *schon* (or *already*, for that matter) will have to be left aside, including Löbner (1989), whose account Krifka (2000) seeks to refine, and Ippolito (2007).

Krifka's (2000) highness analysis is motivated by examples like (54).²⁸ Lydia is conveyed to have grown *fast*, which is a kind of highness rather than lowness. In other words, (54) poses a challenge for the present account.

- (54) Lydia ist schon drei_F Monate alt.
 Lydia is schon three_F months old
 ~> Lydia has grown *fast*

There are no highness-accounts of *jiu* I am aware of. But Lai (1999) presents an example where *jiu* seems to have a similar effect to *schon* in (54): In (55), three apples are implied to be a lot.

- (55) (Cai wu fenzhong) Lisi Lisi jiu chi san-ge pingguo le.
 (only 5 minutes) Lisi jiu eat 3-CL apple ASP
 ~> 3 apples are *a lot*

On the other hand, as can be seen from (56), 'high' *schon* may preferentially translate as *dou* in Chinese. *dou* sometimes translates as 'even', and is in fact treated as such by Liu (2017), though see Chen (2019) for a recent objection. *even*, in turn, can be seen as conveying scalar highness: the view that it evaluates its prejacent *p* as least likely easily translates into *p*'s being the strongest alternative.²⁹

- (56) a. Es ist ja schon acht_F!
 it is PRT schon eight_F
 b. {Dou / # jiu} ba_F dian le, kuaidian qichuang!³⁰
 {dou / # jiu} eight_F o'clock ASP quickly get-up
 c. ~> 8 o'clock is *late*

One may take (56) as weak evidence that *schon* sometimes in fact ranks its argument as high on a scale. However, some highness-examples involving *jiu* and *schon* can be reasonably brought under a lowness-analysis. von Stechow (2006) does this for *schon*, following discussions with Doris Penka, and Lai (1999) does it for *jiu*. The essence of both attempts is the following: rather than evaluating the overt focus as high, *jiu/schon* evaluate the speech time as early. This

²⁸ (54) is a *type 2* use in the sense of Löbner (1989). According to Krifka (2000), these are cases where *schon* associates with a sentence predicate in focus.

²⁹ This is an observation I came across in Zimmermann (2018), who explicitly likens *schon* to *even* as conceived of by Beaver & Clark (2008).

³⁰ Variation on an example taken from resources.allsetlearning.com, 2019/07/14; thanks to Jun Chen (pc) for informing me of *jiu*'s infelicity in such sentences.

implicit evaluation enables the speaker to express a discrepancy between the subjective and the objective time: The state of affairs in question was expected to hold at a later time.

Let's apply this line of thought to Krifka's (2000) example in (54). Lydia was expected to be younger than she is asserted to be, which means she was expected to be three months old at a time *later* than the speech time. *schon* doesn't evaluate Lydia's age as high or her growth as fast, it just evaluates the speech time as early. Taking *schon* to spell out temporal LOW, the resulting analysis can be sketched as follows.³¹

- (57) [LOW_{TEMP C} t_{now}] λt. Lydia is 3 months old at t
 ~> t_{now} is the *earliest* C-time
 ~> Lydia has grown *fast*, given how early it is

Britta Stolterfoht (pc) points out a noteworthy exception to this line of approach: It wrongly ascribes a temporal flavor to all cases in which *schon* has a highness-effect. In the following example she provides, the temporal flavor no longer persists:

- (58) Lisi bekommt keinen Apfel mehr, sie hat ja schon drei gegessen.
 Lisi gets no apple more she has PRT schon three eaten

In (58), *schon* evaluates the sheer number of apples eaten rather than the speed with which they were eaten. In other words, *schon* doesn't seem to convey that the speech time is an early time for Lisi to have eaten three apples; the sentence may well be uttered in a situation in which it wasn't clear from the start that she would ever eat as many as three. In other words, *schon* seems to be doing here what Krifka (2000) says it does, evaluate the overt focus on the number as high, and the lowness-analysis only captures some of the highness-cases.³²

Given (58), is it safer to treat *schon* as presupposing highness rather than lowness after all? Further support for such a view comes from a type of example in Grosz (2012):

- (59) {Selbst / schon} wenn nur zwei Leute einsteigen, wird das Boot sinken.
 {even / schon} if only two people get-in will the boat sink
 ≈ 'It only takes two people for the boat to sink.'

schon and *selbst* 'even' are perfectly interchangeable in (59). It is thus understandable why Grosz (2012) explicitly adopts Guerzoni & Lim's (2007) *even*-analysis for *schon*.

However, if we play with (59) just a bit, *selbst* and *schon* fall apart, casting doubt on an *even*-treatment of the latter. Once we have a boat that can be entered by a fairly *high* number of people without sinking, only *selbst* works, and *schon* becomes odd.³³

³¹ It takes wonder whether this fully suffices to capture the attested highness-effect: LOW doesn't evaluate Lydia's age after all. A possible way of capturing highness more directly is to posit silent EVEN at LF, whose existence is by no means an unprecedented assumption to make (Chierchia 2006).

³² It seems that the lowness-analysis only works as long as the sentence predicate naturally changes over time. Lydia would have been 3 months old sooner or later. But Lisi wouldn't have eaten three apples sooner or later.

³³ Something similar seems to happen when the particles occur subject-internally:

- (i) a. This is such a heavy table.
 b. {Selbst / # schon} hundert Leute vermögen ihn nicht zu stemmen.
 {even / # schon} hundred people are-able him not to lift

- (60) {Selbst / # schon} wenn **zehn** Leute einsteigen, wird das Boot **nicht** sinken.
 {even / # schon} if **ten** people get-in will the boat **not** sink

Under the standard view of *even*, *selbst* is correctly predicted to be fine in both (59) and (60): the prejacent *p*, presupposed to be most surprising, is the entire conditional. What is surprising in (59) is how *few* people it takes for the boat to sink. What is surprising in (60) is how *many* people may enter the boat without causing it to sink.

But how can we explain the oddity of *schon* in (60)? Given the analysis put forth in section 2.2, a conditionally flavored variant of LOW combines with the antecedent at LF, presupposing it to be the scalarly lowest (weakest) one in the context.

- (61) [[[LOW_{COND C} [10 ppl enter]] λ*p*. if *p*, the boat won't sink]]
 is defined iff $\forall q \in C : (q \neq [10 \text{ enter}]) \rightarrow ([10 \text{ enter}] <_C q)$.

One may see this PSP as flawed in the given context, where (only) weaker alternatives are salient. *C* arguably looks as follows:

- (62) $C = \{2 \text{ enter}, 3 \text{ enter}, \dots, \mathbf{10 \text{ enter}}\}$

But it was also observed in section 2 that the lowness-PSP doesn't disallow for lower alternatives to be salient, it just acts as a signal to *ignore* them. So why is (60) still odd? Intuitively, the sentence strongly suggests a number of people greater than ten to make the boat ride even safer. This is just not how it works in real life. In other words, the blame can be put on an additive implication that we haven't even discussed yet. But this issue will be put up in this paper's conclusion below.

To sum up this subsection on *schon*, we have seen that some, but not all of the data underlying Krifka's (2000) view of *schon* as presupposing highness can be reduced to a lowness-analysis in the way suggested by Lai (1999) and von Stechow (2006). We have also seen that there is no easy way to reduce *schon* to *even*. The only serious problem a lowness-analysis seems to face at this point are the highness-cases that seem irreducible to lowness, like Britta Stolterfoht's counterexample in (58).

5 Conclusion

This paper offers a unified account of two particles from two unrelated languages, Mandarin *jiu* and German *schon*, as well as of two of their uses, temporal and conditional ones. Mainly inspired by Lai's (1999) and Liu's (2017) work on *jiu*, both particles are semantically reduced to an LF-operator LOW whose type-flexibility allows us to derive both kinds of uses. Based on Hole's (2004) co-occurrence data and the consequences he draws, section 3 refines the view of *jiu* so as to treat it as merely agreeing with LOW rather than spelling it out. In this agreement

(intended:) 'Not even a hundred people are able to lift it.'

However, Doris Penka (pc) has pointed me to a potential confounding factor: The sentence predicate's *downward scalarity* in the sense of Beck & Rullmann (1999) plays a role here, too. The *schon*-variant of (i-b) remains odd even if the numeral is replaced by a low number.

configuration, LOW is conceived of as carrying an interpretable lowness-feature [iLOW], and *jiu* as carrying its uninterpretable counterpart [uLOW]. [iLOW] may well be seen as a semantic universal, given its occurrence in two unrelated languages like Mandarin and German. And it is plausibly shared with ONLY insofar as the latter also presupposes scalar lowness (Guerzoni 2003, Grosz 2012, Liu 2017, Greenberg 2019).

An aspect neglected throughout this paper is an additive implication *schon/jiu* may give rise to, see footnotes 1 and 6. The temporal and conditional examples we started out with are cases in point: (63-a) implies rain to keep falling after the speech time; (63-b) implies other possible actions performed by the hearer to make the speaker just as happy.

- (63) a. Jetzt regnet es **schon**.
 now rains it **schon**
 ~> **it will keep raining after** t_{now}
- b. Wenn du lächelst, bin ich **schon** glücklich.
 if you smile am I **schon** happy
 ~> **there is something other than smile such that if you do it, I'll be happy**

Given the implications in (63), one may ask if *schon*, aside from carrying [iLOW], also carries an interpretable additive feature [iADD], and if *jiu* should not only be assigned a [uLOW], but also a [uADD]. An affirmative answer comes from Ippolito (2007), on whose account a variant of *already* she calls *aspectual* triggers an additive PSP in a sentence like (63-a). But as with the scalar particle *even*, it is possible to bring up cases where no additive implication arises (Paula Menéndez-Benito, Zhuo Chen, pc):

- (64) Heinrich kam schon um 5.
 Henry came schon at 5
 'Henry already arrived at 5.'
 ~/~> Henry kept coming after 5

In section 4.4.1 in Wimmer (2020), I loosely follow Rullmann's (1997) discussion on *even* in taking the contrast between (63) and (64) to suggest that *schon* does not trigger an additive PSP; it does license a strong additive implication in (63), but one that (64) proves to be blocked once something gets in its way, the punctual nature of the predicate *come* in this case. So in the end, one may refrain from endowing *schon* with an [iADD] and *jiu* with a [uADD].

References

- Beaver, David & Brady Clark. 2008. *Sense and sensitivity: how focus determines meaning*. Wiley-Blackwell.
- Beck, Sigrid (2007). The grammar of focus interpretation. *Interfaces + recursion = language?*, ed. Uli Sauerland & Hans-Martin Gärtner, 255–280.
- Beck, Sigrid. 2019. Readings of scalar particles *noch/still*. *Linguistics and Philosophy* 43 (1), 1–67.

- Beck, Sigrid (2019*). Class handout, research seminar on presuppositional particles PPP, Universität Tübingen, summer semester.
- Beck, Sigrid & Hotze Rullmann. 1999. A flexible approach to exhaustivity in questions. *Natural Language Semantics* 7 (3), 249–298.
- Brody, Michael. 1997. Perfect chains. *Elements of grammar*, ed. Liliane Haegeman, 139–167. Kluwer.
- Chen, Zhuo. 2019. Keeping *dou* as a simple distributor. *Proceedings of the 22nd Amsterdam Colloquium*, ed. Julian Schlöder, Dean McHugh & Floris Roelofsen, 71–80.
- Chierchia, Gennaro. 2006. Broaden your views: implicatures of domain widening and the “logicality” of language. *Linguistic Inquiry* 37 (4), 535–590.
- Chomsky, Noam (1995). *The Minimalist Program*. Cambridge, MA: MIT Press.
- Coppock, Elizabeth & Anna Lindahl. 2014. Minimal sufficiency readings in conditionals. *Proceedings of the 15th Texas Linguistic Society*, ed. Christopher Brown, Qianping Gu, Cornelia Loos, Jason Mielens & Grace Neveu, 24–38.
- Coppock, Elizabeth & David Beaver. 2014. Principles of the exclusive muddle. *Journal of Semantics* 31 (3), 371–432.
- von Fintel, Kai (1994). *Restrictions on quantifier domains*. PhD thesis, UMass Amherst.
- von Fintel, Kai (2011). Conditionals. *Semantics: an international handbook of natural language meaning*, vol. 2, ed. Klaus von Heusinger, Claudia Maienborn & Paul Portner, 1515–1538.
- von Fintel, Kai & Irene Heim (2011). *Lecture notes on intensional semantics*. Ms., MIT.
- von Fintel, Kai & Sabine Iatridou (2007). Anatomy of a modal construction. *Linguistic Inquiry* 38 (3), 445–483, MIT Press.
- Greenberg, Yael. 2019. *even* and *only*: arguing for parallels in scalarity and in constructing alternatives. *Proceedings of NELS 49*, ed. Maggie Baird & Jonathan Pesetsky.
- Grosz, Patrick Georg. 2012. *On the grammar of optative constructions*. John Benjamins.
- Guerzoni, Elena. 2005. *Why even ask? On the pragmatics of questions and the semantics of answers*. PhD thesis, MIT.
- Guerzoni, Elena & Dongsik Lim. 2007. Even if, factivity and focus. *Proceedings of Sinn und Bedeutung 11*, ed. Louise McNally & Estela Puig-Waldmüller, 276–290.
- Heim, Irene & Angelika Kratzer. 1998. *Semantics in generative grammar*. Blackwell.
- Hole, Daniel. 2004. *Focus and background marking in Mandarin Chinese: System and theory behind cai, jiu, dou and ye*. Routledge.
- Hole, Daniel. 2006. Mapping VPs to restrictors: Anti-Diesing effects in Mandarin Chinese. *Where semantics meets pragmatics*, ed. Klaus von Heusinger & Ken P. Turner, 337–380. Elsevier.
- Hole, Daniel. 2017. A crosslinguistic syntax of scalar and non-scalar focus particle sentences: the view from Vietnamese and Chinese. *Journal of East Asian Linguistics* 26 (4), 389–409.
- Iatridou, Sabine. 1993. On the contribution of conditional *then*. *Natural Language Semantics* 3 (2), 171–199.
- Ippolito, Michela. 2007. On the meaning of some focus-sensitive particles. *Natural Language Semantics* 15 (1), 1–34.
- Krifka, Manfred. 2000. Alternatives for aspectual particles: semantics of *still* and *already*. *Proceedings of the Annual meeting of the Berkeley Linguistics Society* 26 (1), 401–412.
- Lai, Huei-Ling. 1999. Rejected expectations: the scalar particles *cai* and *jiu* in Mandarin Chinese. *Linguistics* 37 (4), 625–661.

- Lee, Youngjoo (2005). Exhaustivity as agreement: the case of Korean *man* ‘only’. *Natural Language Semantics* 13 (2), 169–200.
- Liu, Mingming. 2016. Exclusive and non-exclusive ONLY in Chinese and English. Poster presented at WCCFL 34. DOI: <https://mmarkliu.files.wordpress.com/2017/02/liuwccfl.pdf> [2018/12/11].
- Liu, Mingming. 2017. Varieties of alternatives: Mandarin focus particles. *Linguistics and Philosophy* 40 (1), 61–95.
- Löbner, Sebastian (1989). German *schon – erst – noch*: an integrated analysis. *Linguistics and Philosophy* 12, 167–212.
- Panizza, Daniele & Yasutada Sudo. 2020. Minimal sufficiency with covert *even*. *Glossa* 5 (1).
- Partee, Barbara (1986). Noun phrase interpretation and type-shifting principles. *Studies in discourse representation theory and the theory of generalized quantifiers*, ed. Jeroen Groenendijk, Dick de Jongh & Martin Stokhof, 115–143. Foris.
- Pesetsky, David & Esther Torrego. 2007. The syntax of valuation and the interpretability of features. *Phrasal and clausal architecture: syntactic derivation and interpretation*, ed. Simin Karimi, Vida Samiian & Wendy K. Wilkins, 262–294. John Benjamins.
- Poole, Ethan. 2017. *Movement and the semantic type of traces*. PhD thesis, UMass Amherst.
- Quek, Yihui & Aron Hirsch (2016). Severing focus form and meaning in Standard and Colloquial Singapore English. *Proceedings of NELS 47*, ed. Andrew Lamont & Katerina Tetzloff, 15–24.
- Rullmann, Hotze. 1997. Even, polarity, and scope. *Papers in Experimental and Theoretical Linguistics* 4, ed. Martha Gibson, Grace Wiebe, and Gary Libben, 40–64.
- Stalnaker Robert. 1980. A defense of Conditional Excluded Middle. *IFS. The University of Western Ontario Series in Philosophy of Science* 15, ed. In: William L. Harper, Robert Stalnaker & Glenn Pearce, 87–104. Springer.
- von Stechow, Arnim. 2006. *Times as degrees: früh(er) ‘early(er)’, spät(er) ‘late(r)’, and phase adverbs*. Ms., Universität Tübingen.
- Schlenker, Philippe. 2004. Conditionals as definite descriptions (a referential analysis). *Research on Language and Computation* 2, ed. Ruth Kempson & Klaus von Heusinger, 417–462.
- Sun, Yenan. 2019. *A bipartite analysis of zhiyou ‘only’ in Mandarin Chinese*. Ms., University of Chicago.
- Tham, Shiao Wei. 2005. Review of Hole (2004). *The Linguist List*. DOI: <https://linguistlist.org/issues/16/16-1718.html>.
- Tsai, Cheng-Yu Edwin. 2017. Preverbal number phrases in Mandarin and the scalar reasoning of *jiu*. In: *Proceedings of WCCFL 34*, ed. Aaron Kaplan, Abby Kaplan, Miranda K. McCarvel, & Edward J. Rubin, 554–561.
- Wimmer, Alexander. 2020. *On certain conditionals*. PhD thesis, Universität Tübingen.
- Zeijlstra, Hedde. 2007. Modal concord. *Proceedings of SALT 17*, ed. T. Friedman & M. Gibson, 317–332.
- Zhang, Linmin & Jia Ling. 2017. Mandarin Chinese particle *jiù*: a current question restrictor. Slides presented at TEAL 11. DOI: http://semanticsarchive.net/Archive/TIkNmU5N/ZhangLing_2017_TEAL11.pdf [2018/03/04].
- Zimmermann, Malte. 2018. Wird schon stimmen! A degree operator analysis of *schon*. *Journal of Semantics* 35 (4), 687–739.

