A Semantic Account of the Intervention Effects in Chinese Why-Questions

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Abstract. This paper revisits intervention effects in Mandarin Chinese *why*-questions. I present new data showing that the ability for quantifiers to induce intervention hinges upon their monotonicity and their ability to be interpreted as topics. I then develop a semantic account that correlates topicality with monotone properties. Furthermore, I propose that *why*-questions in Chinese are idiosyncratic, in that the Chinese equivalent of *why* directly merges at a high scope position that stays above a propositional argument. Combining the semantic idiosyncrasies of *why*-questions with the theory of topicality, I conclude that a wide range of intervention phenomena can be accounted for in terms of interpretation failure.

Keywords: Intervention effects · *Why*-questions · Illocutionary acts · Wide-scope indefinites · Mandarin Chinese

1 Data

This paper presents a semantic account of the quantifier-induced intervention effects in Chinese *why*-questions, schematized as follows.

(1) #[$_Q$ [*Quant why*]]

That is, unacceptability arises when a quantifier c-commands the interrogative phrase *why*. Using Chinese data, this paper argues that the intervention induced by *why*-questions is distinct from other intervention effects that arise in non-*why* interrogative questions, which have received detailed investigations in the literature.[1] Specifically, I present new data showing that intervention effects in

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[1] See Beck [5] for a semantic account of intervention in non-*why* *wh*-questions, Beck and Kim [6] for a similar account of intervention in alternative questions, and Tomioka [59] for a pragmatic, information structure-based account of intervention effects in non-*why* constituent questions.

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Chinese *why*-questions are sensitive to the type of quantifier. Since the Mandarin Chinese-speaking community is huge by population size and internal linguistic/social diversity, there is an important issue as to the extent of variation in how an exhaustive list of quantifiers is accepted. The previous literature has (understandably) tended to abstract away from any such variation. While I won't be able to offer any characterization of the nature of variation here, to the degree possible I have tried to minimize variation by focusing on a specific dialect group: the Mandarin spoken in Beijing and the adjacent *Dongbei* 'Northeast' provinces. My primary consultants are three female speakers in their twenties. Two additional male speakers in their thirties are recruited for a subset of the elicited data. All of them come from the above two regions.

As (2) shows, when *weishenme* 'why' is c-commanded by a monotone decreasing quantificational DP, oddness ensues.[2]

(2) #{Meiyou ren /Henshao ren/Budao san-ge ren}
{No person /few person/Less.than three-CLF person}
weishenme cizhi?
why resign
#'{For nobody/For few people/For less than three people}, why did they resign?'

In contrast, a quantificational DP with a simplex monotone increasing determiner, such as *most people*, or *a few people*, does not induce intervention effects.[3]

(3) {Daduoshu ren /Shaoshu ren} weishenme cizhi?
{Most person /A.few person} why resign
'{For a majority group of people/for a minority group of people}, why did they resign?'

To make things more complex, one class of monotone increasing quantificational DPs with morphosyntactically complex determiners induce weak intervention. This class includes modified numerals such as *at least three people*, *more than three people*, etc. Non-monotonic bare numerals, such as *three people*, also induce weak intervention. An example is given in (4).

[2] The glossing in this paper follows the Leipzig Glossing Rules (https://www.eva.mpg.de/lingua/resources/glossing-rules.php). A list of the abbreviations in this paper is given as follows:
ACC: accusative; CLF: classifier; COP: copula; DEM: demonstrative; NEG: negative, negation; NOM: nominative; LOC: locative; PASS: passive; PL: plural; POSS: possessive; PRF: perfect; PRS: present; PRT: particle; PST: past; Q: question particle; REL: relativizer; RES: resultative; TOP: topic marker.

[3] Based on monotonicity, I treat the Chinese quantifier *henshao ren* as an equivalent of *few people*, since both require a less-than-half cardinality reading and are monotone decreasing. Furthermore, I treat *shaoshu ren* as an equivalent of *a few people*, as they pattern together as non-monotonic quantifiers with a less-than-half reading. It is also worth noting that *a few people*/*shaoshu ren* generally give rise to a non-empty scalar implicature (see Horn [28]), whereas *few people*/*henshao ren* generally do not.

(4) ??{San-ge ren/ zhishao san-ge ren/ chaoguo
{Three-CLF person/ at.least three-CLF person/ more.than
san-ge ren} weishenme cizhi?
three-CLF person} why resign
'{For three people/at least three people/more than three people}, why did they resign?'

My notational choice here, using ?? in (4) to contrast with the use of # in (2), will be justified in my coming argument that the unacceptability found in examples in (2) results from interpretation failure, whereas the unacceptability in (4) is a case of contextual infelicity. The choice also reflects the intuition of my consulted speakers. When uttered out of the blue, (4) triggers rather low judgments for some speakers, while for other speakers the oddness is less severe than that which is induced in monotone decreasing contexts. So far, I have only discussed matrix *why*-questions. In an embedded *why*-question, morphosyntactically simplex monotone increasing quantifiers still induce no intervention, as shown by the perfectly acceptable sentence as follows:

(5) Wo yijing zhidao-le {daduoshu ren/shaoshu ren} weishenme
I already know-PRF {most person/a.few person} why
cizhi.
resign
'I already knew for {a majority/a minority group of people}, why they resigned.'

More noteworthy is the fact that the *weak* intervention we witness in (4) disappears in embedded *why*-questions. This is demonstrated by the acceptability of (6).

(6) Wo yijing zhidao-le {san-ge ren/zhishao san-ge
I already know-PRF {three-CLF person/at.least three-CLF
ren/chaoguo san-ge ren} weishenme cizhi.
person/more.than three-CLF person} why resign
'I already knew for a group of (at least/more than) three people, why they resigned.'

By comparison, intervention cannot be circumvented in embedded contexts for monotone decreasing quantifiers. As (7) illustrates, the unacceptability in an embedded *why*-question is as strong as it is in a matrix one.

(7) #Wo yijing zhidao-le {meiyou ren/henshao ren/budao
I already know-PRF {no person/few person/less.than
san-ge ren} weishenme cizhi.
three-CLF person} why resign
#'I already knew for {nobody/few people/less than three people}, why they resigned.'

In sum, intervention effects in Chinese *why*-questions are sensitive to quantifier monotonicity. In addition, they are sensitive to whether *why*-questions occur in matrix or embedded contexts. The overall pattern is summarized in (8):

(8) Matrix and embedded *why*-questions:
1. Monotone decreasing quantifiers consistently induce intervention effects;
2. Non-monotone increasing, non-numeral quantifiers do not induce intervention effects;
3. (Monotone increasing) modified numerals and (non-monotonic) bare numerals induce weak intervention in matrix *why*-questions, which is ameliorated under embedded contexts.

Apart from quantificational DPs, adverbs of quantification exhibit similar patterns. (9) illustrates the ban for monotone decreasing quantificational adverbs to c-command *weishenme* 'why'.

(9) a. #Ta congbu weishenme cizhi?
He never why resign
#'On no occasions, why did he resign?'
b. #Ta henshao weishenme cizhi?
He seldom why resign
#'On few occasions, why did he resign?'

Furthermore, this ban on c-commanding quantificational adverbs is lifted if the adverbs are monotone increasing or non-monotonic:

(10) a. Ni dabufen shijian weishenme juede kun?
You most time why feel be.drowsy
'For most of the occasions, why did you feel drowsy?'
b. Wo yijing zhidao-le ta zhishao liang-ci weishenme
I already know-PRF he at.least two-token why
bu-gan zuo zhei-jian shi.
NEG-dare do DEM-CLF affair
'I already knew, for at least two occasions, why he wouldn't dare to do that.'

In this paper, I propose to account for this complex array of data in terms of the idiosyncratic semantics of *weishenme* 'why'. In a nutshell, I argue that Chinese *weishenme* must be initially merged at the high scope position of [Spec, CP]. When quantifiers are interpreted as taking wide scope over [Spec, CP], we obtain coherent interpretations. On the other hand, intervention arises when certain quantifiers are unable to be interpreted at such high scope. Hence, this account of intervention effects in *why*-questions does not involve 'real' intervention, in the sense that no mechanism of covert movement is assumed. Rather, my central claim in this paper is that the unacceptability we are dealing with here is not

syntactic ill-formedness, but interpretational failure, i.e., a native speaker cannot assign an interpretation to a *why*-question in certain scopal relations.[4]

The rest of this paper is structured as follows. Section 2 reviews previous syntactic theories of the Chinese intervention effects in *why*-questions. Section 3 develops a semantic account with reference to *why*'s syntactic and semantic idiosyncrasies. Afterwards, I provide evidence that the intervention patterns of quantifiers correlate with quantifier monotonicity. Section 4 concludes the paper.

2 Past Accounts of the Quantifier-Induced Intervention Effects

In this section, I review several recent approaches to the Chinese intervention effects in *why*-questions that resort to covert LF movement. I then show that this line of research holds out little promise in accommodating the full range of data as discussed in the previous section. In the next section, I develop a semantic account that achieves the desired empirical coverage.

Building upon Beck [5] and Pesetsky [44], Soh [54] proposes that *in situ weishenme* 'why' undergoes covert feature movement at LF. According to Soh, intervention effects detect the movement of *wh*-feature, such that the feature cannot be separated from what's left behind on the *wh*-phrase by a scope-bearing element. Cheng [11] echoes Soh's solution, taking intervention effects as one crucial piece of evidence for the existence of covert feature movement.

Yang [63,64] reformulates the covert feature movement approach in terms of the framework of Relativized Minimality [47–49]. In a nutshell, intervention is a minimality effect, in which the quantificational 'likeness' between a quantifier and the interrogative phrase *weishenme* 'why' means that the feature of *weishenme* is attracted to the left periphery scope position only if it is closer to the scope position than the quantifier is. Yang borrows from recent works of Starke [55] and Rizzi [49] on Relativized Minimality and provides the following condition, in which the minimality effect is captured in terms of a filter:

(11) Maximal Matching Filter (Yang 2011, 63)
Let X and Y be bundles of features in a sequence of [...X...Y...]; Y cannot cross X when Y is maximally matched by X.

If a scopal element A bears feature [F1] and moves to its left periphery scope position, and if another scopal element B has the feature geometry that includes the bundle [F1 F2], then the movement of A from its initial merge position to its scope position is blocked because the bundle [F1 F2] *maximally matches* [F1].

[4] Consequently, I choose to put a # sign before unacceptable Chinese *why*-question sentences as well as their English translations to indicate that the examples are odd because the readings they generate are semantically anomalous. However, I still consistently use the term 'intervention effects' to refer to the types of phenomena that are already well established in the tradition, without taking this term in its literal sense.

In other words, the filter condition rules out the scope-taking of an operator at the left periphery when a 'like' operator is closer to the scope position of said operator.

The criteria of operator type matching are determined as follows (Rizzi [49]: 19):

(12) a. Argumental: person, number, gender, case
b. Quantificational: Wh, quantifier, measure, focus...
c. Modifier: evaluative, epistemic, Neg, frequentative, celerative, measure, manner, ...
d. Topic

Based on this classification, quantifiers as well as focus-sensitive phrases (focus) possess the same quantificational feature as the interrogative operator (Wh). Apart from the quantificational feature, quantifier/focus also bear other features. In a [quantifier < Wh] configuration, the maximal matching filter is violated during the covert feature movement, because Wh's quantificational feature is maximally matched by the intervening quantifier.

Other *wh*-phrases such as *shenme* 'what' and *zenme* 'how' do not cause intervention in the same way as *weishenme* 'why' [56]. For Soh [54], the absence of intervention is because these *wh*-phrases undergo covert phrasal movement, rather than feature movement. In phrasal movement, entire *wh*-phrases are pied-piped across quantificational interveners. As such, there is no separation between *wh*-feature and the restriction on *wh*-phrases [44]. Yang [64] accounts for the absence of intervention by resorting to the mechanism of unselective binding [43]. For instance, Yang cites Cheng and Rooryck [12] and endorses the view that *wh*-phrases have the option of being licensed at a distance by a Q operator that merges directly at [Spec, CP]. According to this view, in *weishenme* 'why'-questions, intervention arises because the *weishenme*-adjunct does not possess this option, and ergo must be licensed via covert feature movement. In contrast, other *wh*-phrases can be licensed by unselective binding and undergo no movement, in which case the maximal matching filter is vacuously satisfied and no intervention arises. Note in addition that Yang's framework is also compatible with a covert phrasal movement solution: Pied-piped *wh*-phrases may be argued to bear more features than intervening quantifiers, therefore the maximal matching filter is not violated, unlike in feature movement.

The minimality-based approach as specified above is problematic upon closer scrutiny. This is because the minimality approach treats all quantifiers (both quantificational nominal phrases and adverbs of quantification) as legitimate interveners that block the LF movement of an interrogative operator. Quantifiers are interveners, simply because they bear a quantificational feature. Therefore, this approach would not predict the Chinese intervention pattern, where the intervention is sensitive to the types of quantifiers. Instead, the approach as it stands should predict that a finer distinction within quantifier types will not make any difference in intervention. If quantifiers in general possess enough features to maximally match the interrogative operator, then by including monotonicity as a

further dimension in the feature geometry we only increase the inventory of the feature set for the quantifiers. Therefore, both monotone increasing and decreasing quantifiers are supposed to maximally match the interrogative operator and block its covert movement. Furthermore, it is rather stipulative if we bring monotonicity into our feature geometry, especially given that we find no independent evidence that monotonicity plays a role in other intervention environments (i.e., those involving non-*why* interrogative questions). Given the lack of apparatus to allow only a subset of quantifiers to block covert LF movement, it seems that the validity of a minimality account is in question. Finally, in embedded questions, a minimality account predicts that the covert interrogative operator still moves to take the embedded [Spec, CP] scope position (crossing the quantificational interveners along the way). Hence, even assuming that quantifier types can be fine-tuned to accommodate the intervention data in matrix questions that we have seen in (2)–(4), it is mysterious how a minimality account handles the selective amelioration phenomenon in the embedded questions of (5)–(7) in a principled manner.

The restricted set of quantificational interveners, i.e., downward quantifiers only, is reminiscent of another intervention environment that has received rich treatment, namely negative islands. It thus evokes the possibility that the intervention phenomenon in Chinese is subsumed under negative island sensitivity. A full survey of this connection is not available in the literature, in part due to the lack of dedicated literature of negative islands in Chinese. At present, I would like to point out that *why* is generally excluded from discussions of negative islands for being rather 'atypical'. Both Szabolcsi and Zwarts [58] and Abrusán [1] explicitly rule out *why*-questions in their theories of negative islands, noticing that *why* differs from other *wh*-adjuncts in that its extraction is blocked in a wider range of environments than others, suggesting that *why* independently favors late insertion/high attachment in the structure. The idiosyncratic structural property of *why* will be discussed in the following.[5]

[5] On a separate note, the modal obviation effect that is associated with negative islands (cf. Abrusán [1]) is absent in Chinese *why*-questions. In (ia), I show that adding the modal *keyi* 'can/might' circumvents the negative islands in a *how many*-question. In (ib), in contrast, I show that adding the same modal fails to improve a *why*-question.

(i) a. Zai zhongguo, meiyou ren keyi sheng duoshaoge haizi?
At China, no person can give.birth.to how.many children
'In China, how many children$_i$ can nobody give birth to t$_i$?'
b. #Zai zhongguo, meiyou ren weishenme keyi mianshui?
At China no personwhy can exempt.taxation
#'In China, why$_i$ can nobody be exempt from taxes t$_i$?'

If the modal obviation effects, as the majority of accounts of negative islands assume, serve as a diagnostic for islandhood in negative contexts, then the contrast in (ia-b) provides additional evidence that the intervention pattern witnessed in *why*-questions is a different beast.

3 A Semantic Account of the Intervention Effects in Chinese Why-Questions

3.1 The Syntax and Semantics of *weishenme* 'Why'

In this section, I build on previous observations that the reason/cause *wh*-adjunct *why* behaves in a different way from other *wh*-phrases. Following Ko [33], I assume that, crosslinguistically, *why*-adverbs favor high merge. Specifically, the East Asian (Chinese, Japanese, Korean, etc.) counterparts of *why* are directly merged at [Spec, CP], as opposed to other *wh*-phrases that are moved to [Spec, CP] from a lower initial merge position. In what follows, I cite a few published data that motivate the above treatment. As early as Lawler [40], it has been proposed that, in a *why*-question, *why* does not associate with any variables in the clause that it attaches to. For example, in the following mono-clausal sentence, it has been proposed that *why* does not bind a trace that links to the VP *leave* [48].

(13) Why did John leave early?

The no-trace property of *why* is seen more clearly in (14). As Lawler [40] points out, only one reading is available in the following quantificational environment:

(14) Why did three men leave?
Reading A: 'Why is it the case that three men left?'
Reading B: #'What reason$_i$ did three men have t_i for leaving?'

In reading A, an event, three men left, is presupposed. By wondering why this event occurs, we are committed to a situation in which the total number of people that left has to be three. In reading B, it is also the case that a group of three individuals left. Yet there is no requirement that, in this situation, altogether three people left. There could be other individuals who left, but for some reason the speaker is only concerned with a specific group of three people. When it happens that only three people left in the context, the two readings are not distinguishable. Crucially, however, when the context contains more than three individuals having left, the *why*-question in (14) cannot be uttered, at least according to the speakers Lawler [40] consulted.

Furthermore, it has been observed that *why* cannot be associated with the embedded clause (or the long-distance construal), and can only be associated with the matrix clause (or the short-distance construal). This can be exemplified by the examples in (15) [10,41].

(15) Why did you regret that Dr. Graff left the academia?
Reading A: 'What reason caused you to regret the fact that Dr. Graff left the academia?'
Reading B: #'What reason$_i$ did you regret that Dr. Graff have t_i for leaving the academia?'

Bromberger [9] argues that the above data would again follow if *why* merges directly to its scope position, and cannot be incorporated into the rest of the

sentence by means of a trace. Bromberger points out a further piece of evidence, in which *why* and other *wh*-phrases interact with scopal elements such as focus operators in different ways.

(16) a. Why did ADAM eat the apples?
b. When did ADAM eat the apples?

Here I use small caps to mark that *Adam* is a focussed constituent. While (16a) presupposes that only Adam ate the apples, (16b) is compatible with the reading in which every individual ate the apples at different times, and the speaker is simply concerned with the time of Adam's eating event. Bromberger [9] argues that we can account for the reading in (16b) if we assume that *when* is base-generated in a position below the focus operator and that it binds a trace after it undergoes movement. Let's assume that the focus operator provides a focus value against a set of alternatives. That is, we first have a set of alternatives in the form of {*x eat the apples when* | x ranges over contextually relevant individuals}. The focus operator then applies to the set of alternatives, setting the value of x to Adam (In Bromberger's representation: (When$_i$) {(∃x: x = Adam){x ate the apples at t_i}}). On the other hand, if *why* leaves behind no trace and directly merges above the scope of the focus operator, then the focus value will be set to Adam first, before we use *why* to ask for the reason (In Bromberger's representation: (Why) {(∃x: x = Adam){x ate the apples}}). As a result, a *why*-question presupposes that only Adam, out of all individuals, ate the apples.

Related to the above observations, Tomioka (2009) demonstrates that, in downward entailing environments, *why* triggers different presuppositions from other *wh*-phrases. Compare (17a) with (17b), taken from Japanese.

(17) a. Daremo naze ko-nak-atta-no?
Anyone why come-NEG-PAST-Q
'Why did no one come?'
Presuppose: No one left.
Not Presuppose: There is a reason that no one left for.
b. Daremo nani-o yom-ana-katta-no?
Anyone what-ACC read-NEG-PAST-Q
'What$_i$ did no one read t_i?'
Presuppose: There is something such that no one read it.
Not Presuppose: No one read anything.

In line with the above observations, Tomioka formulates the following semantic constraint for *why*:

(18) Tomioka's constraint:
In a *why*-question and only in a *why*-question, the proposition that corresponds to the non-*wh* portion of the question must be presupposed.

This constraint calls for a high merge position of *why*, which Ko [33] assumes to be [Spec, CP]. Ko's proposal is exclusively about counterparts of *why* in East Asian

languages such as Chinese, Japanese and Korean. Independently, Rizzi [48] argues that *perché* 'why' in Italian merges directly at [Spec, IntP]. Rizzi assumes that the head of IntP carries a [+wh] feature inherently, therefore this direct high merge explains why *perché* does not trigger auxiliary inversion. Given that there is no motivation for a structural distinction between [Spec, CP] and [Spec, IntP] in East Asian languages, we can essentially consider Rizzi's high attachment analysis of *perché* the same as Ko's proposal for East Asian *why*s. What is important for our current purpose is that both [Spec, CP] and [Spec, IntP] are higher than the scope positions of the focus operator and quantifiers at the left periphery (according to Rizzi), thus capturing the readings such as in (16) and (17).

3.2 Quantifiers as Plural Indefinites

If Chinese *weishenme* 'why' directly merges at [Spec, CP], it does not take part in quantifier scope interactions, because it is directly interpreted at a scope position above quantifier scope. Moreover, Chinese is known to observe a scope isomorphism at the left periphery, such that scopal relations at LF are preserved at surface syntax [2,21]. Unlike Japanese or Korean, Chinese quantifiers cannot scramble across outscoping operators to create a mismatch between word order and scope order [33]. Therefore, we would expect that quantificational elements, when taking scope as a generalized quantifier, be c-commanded by *weishenme*. However, in (19a-b), we see that *weishenme* and quantifiers may occur in two relative orderings.

(19) a. Weishenme daduoshu ren cizhi?
Why most person resign
'Why (is it the case that) most people resigned?'

b. Daduoshu ren weishenme cizhi?
Most person why resign
'For a certain plurality of individuals that is the majority of all the context-relevant individuals, why did they resign?'

In (19a), where *weishenme* c-commands the quantifier *duoshu ren* 'most people', we obtain an expected reading in which the latter denotes a standard GQ meaning, and *weishenme* takes the entire quantified proposition as its argument. Importantly, the question in (19b) does not seem to involve a generalized quantifier that scopes below *weishenme*. What (19b) asks is the reason that causes one particular plurality of individuals to resign, and this plurality has to be a majority subset of all the context-relevant individuals. For (19a), an answer can be given in the form of (20):

(20) Yinwei zhiyou shaoshu ren manyi gongsi de
Because only minority person be.satisfied.with company REL
xinchou daiyu.
pay treatment
'Since only a minority (of employees) were satisfied with the payroll of the company (and hence didn't resign).'

Meanwhile, (20) cannot be an answer for (19b). A felicitous answer must provide a reason of resignation for a *particular* plurality of individuals. Therefore, the reading of (19b) suggests that *most people* receives the interpretation of a plural indefinite and exhibits exceptional wide scope, above the scope of *why*, which is characteristic of plural indefinites. Both Reinhart and Winter have proposed that quantifier phrases such as *some people* or *many people* can be interpreted as plural indefinites, in which they do not denote a relation between predicates, in the traditional sense of Barwise and Cooper [4]. Rather, they denote individuals, by being coerced into a minimal witness set [19].[6]

In this paper, I propose that *most people* may also denote a plural indefinite. To go one step further, I argue that the plural indefinite *most people* is a topic when it takes wide scope over *weishenme* 'why'. That is, I believe that exceptional wide scope is a topic phenomenon [19]. A topical reading is possible for quantifiers interpreted as plural indefinites, because all referring expressions that are individual-denoting may serve as topics under the right contextual conditions. Importantly, I argue that topics are able to take scope outside of a speech act (that is, they may scope above the illocutionary operator of a sentence). As such, topics scope above the high initial merge position of *weishenme* in a *weishenme*-question. This accounts for the exceptional wide scope position of plural indefinites.

3.3 The Wide Scope Behavior of Topical Quantifiers: Some Evidence

Below I present evidence that topics are able to take scope outside speech acts. In the next section, I show that the ability for quantifiers to be topics depends on their monotonicity. Various authors have pointed out that if any part of a proposition is capable of scoping out of a speech act, it will have to be a topic [18,36,45]. This is because topic establishment is a separate speech act by itself. The idea that topics are assigned illocutionary operators of their own is first raised in Jacobs [31]. Jacobs points out that introducing a topic is an act of frame setting. In the following, I follow Krifka's recent position that natural language allows speech acts to conjoin. A topic-comment structure expresses two sequential, conjoined speech acts, comprising the topic's referring act, to be followed by a basic speech act (assertion, request, command, etc.) that is performed as an update on the referent established by the topic. Krifka [36] notes that, in English, overt devices are used to mark topics as scoping out of questions, commands and curses, such as the following:

(21) a. As for Al, Bill and Carl, which dishes did they make?
b. The hamburger, please hand it to me.
c. This guy, he should go to hell!

[6] Witness set refers to the plurality determined by the intersection of the restrictor and the nuclear scope. That is, given a quantificational determiner D, one predicate P and another predicate Q, D(P)(Q) gives rise to the witness set $W = P \cap Q$ [4,57].

According to Krifka, topics even have to scope out of speech acts, given that they function as a separate speech act. In Chinese, if we assume that the topic act conjoins with a subsequent request speech act performed by a *weishenme*-question, we would predict that all the expressions that may serve as topics may occur outside the scope of *weishenme* without causing intervention. This prediction is borne out. As (22) demonstrates, proper names, pronouns and temporal/locative adverbs can legitimately c-command *weishenme*. These are expressions that have long been known to allow for a topic reading [21,39].

(22) a. Lisi weishenme mei qu paobu?
Lisi why NEG go jogging
'As for Lisi, why didn't he go jogging?'
b. Zuotian/Zai na'er weishenme dajia xihuan chi kaorou?
Yesterday/LOC there why folks enjoy eat barbecued.meat
'As for {yesterday/there}, why do folks enjoy eating barbecued meat?'

Example (22) additionally shows that when multiple topics are co-occurring, they can all c-command *weishenme*. There seems to be a functionally based cognitive constraint preventing more than three topics from co-occurring in the same sentence in Chinese. But a sentence with three topics is marginally acceptable [62]. In such case, we also find a *weishenme*-question with three c-commanding topics acceptable:

(23) ?Zhe-chang yinyuehui ni mingtian weishenme yao qu?
This-CLF concert you tomorrow why will go
'(As for) This concert, (talking about) tomorrow, why will you go?'

Furthermore, in biscuit conditionals, an *if*-antecedent may co-occur with a *weishenme*-question as its consequent, illustrated in (24):

(24) Ruguo ni bu-jieyi wo wen dehua, ni weishenme cizhi?
If you NEG-mind I ask PRT, you why resign
'If you wouldn't mind me asking you, why did you resign?'

Various proposals have suggested that the antecedents of biscuit conditionals are topics [18,20], such that they scope out of the speech act performed by the consequents of the conditionals. If this is valid, then it is readily predicted by our proposal of topic act that the antecedent in (24) is able to scope above a *weishenme*-consequent.

Another prediction is that if an element is by nature not topical, it will never c-command *weishenme*. This would readily explain the fact that focus-sensitive expressions also induce intervention in *weishenme*-questions, since they are known to be strongly anti-topical [59]. The following example demonstrates that focus-sensitive phrases also induce intervention effects in *weishenme*-questions. Sentence (25a) is unacceptable, because *weishenme* is c-commanded by the focus sensitive *only*-NP. (25b) and (25c) are similarly unacceptable,

when *weishenme* is c-commanded by the focus adverbial *zhi* 'only' and the focus particle *lian. . . ye/dou* 'even'.[7]

(25) a. #Zhiyou Lisi weishenme cizhi?
Only Lisi why resign
#'For only Lisi, why did he resign?'
b. #Lisi zhi weishenme cizhi?
Lisi only why resign
#'It is only the case that why Lisi resigned?'
c. #Lian Lisi ye/dou weishenme cizhi?
LIAN Lisi YE/DOU why resign
#'For even Lisi, why did he resign?'

Apart from topics, the second class of subsentential expressions that scopes out of illocution are the epistemic attitude adverbs such as *daodi* 'on earth' and *jiujing* 'frankly/honestly'. Importantly, this class of adverbs express epistemic attitude towards speech acts [21,22,30]. As such, they are speech act-level modifiers and take the illocutionary operator as their argument. Hence, they fall outside the scope of illocution. In (26), I show that both a speech-act adverb and a topic may precede *weishenme*:

(26) Ta jiujing/daodi weishenme cizhi?
He in.the.hell/honestly why resign
'As for him, why the hell did he resign?'/ 'As for him, honestly, why did he resign?'

A contrast exists between this class of speech act-level adverbs and proposition level attitude adverbs such as *yiding* 'definitely' and *kongpa* 'probably/most likely', as we can see below:

(27) #Ta yiding/kongpa weishenme cizhi?
He definitely/probably why resign
#'Definitely/Probably, why did he resign?'

Unlike *daodi/jiujing*, adverbs such as *yiding* 'definitely' indicate the speaker's attitude towards the propositional content or contents of smaller units, rather than the speaker's attitude towards the speech act. Interpreting the question operator within the scope of *yiding* creates a semantic anomaly, because such adverb is not compatible with taking question operators as arguments. In other

[7] In (25a), *zhiyou* 'only' forms a constituent with an NP and assigns focus value to the NP. In (25b), *zhi* 'only' is a focus adverb. The *lian* + NP + *ye/dou* construction in (25c) is often assumed to be the Chinese counterpart of the English focus-sensitive *even*-NP [27,42,52]. It seems that *lian* and *ye/dou* together contribute to the semantics of the English focus particle *even*, although the exact nature of the division of labor is still not clear. According to some analyses, *lian* assigns focus accent to the NP it combines with, and *ye/dou* is a maximality operator that overtly expresses the alternatives in the focus value [24].

words, an expression is able to precede *weishenme* if and only if it is able to take the *weishenme*-question's illocutionary operator in its scope. A speech-act level adverb does so by modifying the speech act itself. As such, it patterns with topics and does not cause intervention. Note that I have assumed all along that c-command relation mirrors scopal relation in the Chinese left periphery. This is because long-distance scrambling is impossible in Chinese [21,29,33]. Importantly, scrambled operators reconstruct their scopes at LF. In Japanese and Korean, when generalized quantifiers scramble across the *why*-adjunct at surface syntax, they reconstruct their scope at the trace position [32]. Because reconstruction is not available in Chinese, when quantifiers such as *meiyou ren* 'no one' c-commands *weishenme*, we cannot receive an interpretation in which *meiyou ren* is reconstructed below the scope of *weishenme*.[8]

3.4 Intervention as a Speech Act Constraint

In the above, I present evidence that topics (together with speech act-modifying epistemic attitude adverbs) are able to scope above speech act. In this section, I show that an exceptional wide scope theory of topics renders a straightforward explanation of the intervention in Chinese *why*-questions.

First, I briefly discuss how a scope theory of topics can be couched in a formally precise framework of speech act establishment and conjoining. Here I follow the Wittgensteinian view that the speech act of a sentence corresponds to a component of the sentence that combines with the sentence radical. The sentence radical can be seen as unsaturated unless attached to the speech act operator [3,7,13,38,60]. According to Krifka [36], we can define speech act as a semantic object with the basic type a. A speech act operator thus can be seen as taking as input a sentence radical and returning a speech act. For example, the assertion operator ASSERT is of type <<s,t>, a> (taking as input a proposition, and returning a speech act). The question operator REQUEST is of type <<<s,t>, t>, a> (taking as input a set of propositions, and returning a speech act). We further assume that natural language allows speech acts to conjoin. A topic-comment structure expresses two sequential, conjoined speech acts, comprising the referring act of a topic, to be followed by a basic speech act (assertion, request, command, etc.) that is performed against the referent as established by the topic. To capture a topic's referring act, Krifka also posits a referring speech act operator REF of type <e,a>. Finally, & is a conjunction operator that conjoins speech acts (type <a, <a, a>>). In the case where a question is structured into a topic and a comment question, the sentence performs a conjunction of topic establishment and request, represented as the following:

(28) $\textsc{request}\ (<\phi_{topic}, \psi_{comment}>) \rightarrow \textsc{ref}_x\ (\phi_{topic})\ \&\ \textsc{request}(\psi_{comment}(\textsc{x}))$

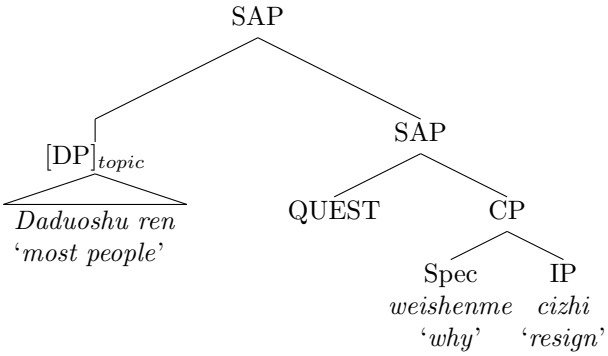
We can further incorporate speech act, as semantic objects with basic types, within the sentence grammar. Krifka [36] proposes that the speech act operator

[8] For further discussions on Japanese and Korean scrambling and reconstruction, see [14,26,51]. For the argument that Chinese does not allow scrambling, see Soh [53].

heads a Speech Act Phrase (SAP) projection that takes the sentence core (CP) as its complement. In the case of topicalization, Krifka proposes that SAPs can be recursively defined. The topic merges to the specifier of the first SAP, the head of which is occupied by another SAP, which is in turn headed by a basic speech act operator taking a CP complement. For instance, in the *why*-question (29a), I analyze the DP *daduoshu ren* 'most people' as a topical quantifier. Under this analysis, this sentence can be represented as (29b) (QUEST being the label used by Krifka for a request operator).

(29) a. Daduoshu ren weishenme cizhi?
Most person why resign
'For most people, why did they resign?'

b.



Finally, I provide a simplified semantics of topical quantifiers used as individual-denoting plural indefinites. To start with, I define a quantifier as witnessable if and only if the quantifier receives a plural indefinite reading, denoting its witness set [16,19,46].

(30) A quantifier is *witnessable* iff it entails the existence of a plurality that satisfies both the quantifier's restrictor and its nuclear scope, *i.e.* it entails the existence of its witness set.

Following Reinhart [46] and Winter [61], witnessable quantifiers denote type-e meaning via a covert choice function variable of type <<e,t>,e> that, given a property (type <e,t>) as input, returns some plurality (type e) that has such property. The quantifiers in individual-denoting DPs are choice function modifiers that add a presuppositional restriction on the cardinality of the entity returned by the function. For example, *most* is represented as (31).

(31) $[\![most]\!] = \lambda f_{<<e,t>,e>} \lambda P_{<e,t>} [f(P) \text{iff} |SUM(f(P))| > {}^{1}/_{2} |y : atom(y) \wedge P(y)|]$

Here SUM is defined over pluralities that consist of atom individuals. Given a plurality, it outputs the set of all the atoms in the plurality. The witnessable quantifier *most people* denotes the plurality returned by the choice function f when applied to the property of being a majority of all the context-relevant individuals, represented as follows:

(32) $[\![most\ people]\!] = [\![[\mathrm{f}\ most]\ people]\!]$
$= f(\lambda x_{\mathrm{e}}\,[people(\mathrm{x}) \wedge |\mathrm{SUM(x)}| > {}^{1}/_{2}|\mathrm{y} : atom(y) \wedge person(\mathrm{y})|])$

The alternatives generated by '[f *most*] *people*' are computed by substituting different choice function variable values in the position of [f *most*]. Combining these alternatives with the restrictor *people*, we produce contrasting pluralities of individuals, each of them contain a majority of all the context-relevant individuals. Crucially, I claim that whereas monotone increasing and non-monotonic quantifiers are witnessable, monotone decreasing quantifiers are not witness-able. A non-witnessable quantifier, such as *few people*, may have a verifiable, non-empty witness set. However, it does not make reference to its witness set by denoting any choice-function selected pluralities.[9]

Now we can derive intervention effects from the interaction of topicalization, conjoined speech acts and witnessability. In a nutshell, if a quantifier is witnessable and hence is able to be construed as topical, it may scope above *weishenme*. On the other hand, if a quantifier cannot be construed as topical, outscoping would be impossible, due to *why*'s high scope. Intervention effects would arise in such cases, because for the non-topicalizable quantifier, the ordering of the quantifier preceding *weishenme* is impossible, hence semantically anomalous. The so-called intervention effects arise when an expression that cannot scope above *why* nevertheless occupies a wide scope position. In other words, there is no 'real' intervention involved here. Rather, the intervention in *why*-questions should be better characterized as a scope effect. In (33a), the *why*-question with the quantifier *daduoshu ren* 'most people' is acceptable as it is interpreted with the semantics in (33b). I also provide a less formal paraphrase of the question's meaning in (33c):

(33) a. Daduoshu ren weishenme qu?
Most person why go
b. Semantics:
REF_{y} (y = f($\lambda \mathrm{x}_{e}$[people(x) ∧ |SUM(x)| > ${}^{1}/_{2}$|y: atom(y)∧person(y)|])) & REQUEST (λq ∃r [q = λw [r CAUSE p in w ∧ p = λw' go (y)(w')]])
c. Paraphrase:
'(Speaking of/As for) the plurality returned by the choice function f when applied to the property of being a majority of all the context-relevant individuals, why are they going?'

[9] Independently, experimental results show that the monotonicity of a quantifier affects its ability to entail a witness set due to processing reasons [8,23]. To verify a quantified sentence containing *most* or *more than two*, one needs to find positive instances that members within the restrictor set satisfy the *most*-relation, the *more-than-two*-relation, etc. In other words, one needs to verify the existence of a witness set. In contrast, for quantified sentences with *no, few, or less than two*, the verification procedure more often requires drawing a negative inference based on the absence of positive instances (in which case the witness set is empty). Although there is still a paucity of relevant work on this topic, the intuition is that monotone decreasing quantifiers are not an informative way to denote a witness set.

On the contrary, the *why*-question with the quantifier *henshao ren* 'few people' is unacceptable because *henshao ren* cannot be a topic. That is, (34a) does *not* have the interpretation in (34b). Also, the paraphrase in (34c) is an impossible one:

(34) a. #Henshao ren weishenme qu?
Few person why go
b. Not compatible with the semantics:
REF_y (y = f(λx_e[people(x) ∧ |SUM(x)| < $^1/_2$|y: atom(y) ∧ person(y)|]))
& REQUEST (λq ∃r [q = λw [r CAUSE p in w ∧ p = λw' go (y)(w')]])
c. Paraphrase:
#'(Speaking of/As for) the plurality returned by the choice function f when applied to the property of being few of all the context-relevant individuals, why are they going?'

In sum, when we consider quantifiers in terms of topicality, we immediately explain why monotone decreasing quantifiers induce intervention effects in *weishenme*-questions: they cannot be topical, hence they cannot give rise to coherent readings in *weishenme*-questions. Non-decreasing quantifiers are unproblematic, because they denote individuals that serve as topics.[10]

Furthermore, this theory claims that bare numerals and monotone increasing modified numerals can be topics. We still need to explain why these numeral quantifiers induce weak intervention, as seen in (35) (repeated from 4):

(35) ??{San-ge ren/ zhishao san-ge ren/ chaoguo san-ge
{Three-CLF person/ at.least three-CLF person/ more.than three-CLF
ren} weishenme cizhi?
person} why resign
'For three people/at least three people/more than three people, tell me why they resigned?'

[10] We should expect that the topicality constraint thus formulated applies even in the absence of *weishenme* 'why', since the topic position is generally available. This prediction is borne out. As mentioned above, the class of epistemic attitude adverbs such as *daodi* 'on earth' and *jiujing* 'frankly/honestly' take scope above speech act operators. This class of adverbs can be used to identify topic positions, in the absence of *weishenme* 'why', because when a quantified expression precedes this class of adverbs, the quantified expression has to reside outside the speech act of the sentence it occurs with and thus must receive a topical reading rather than a GQ reading. Importantly, as (i) shows, monotone decreasing quantifiers induce intervention when they precede epistemic adverbs even in non-*why* questions. Intervention is absent for non-decreasing quantifiers.

(i) a. *Budao san-ge ren daodi/jiujing qu na'er le?
Less.than three-CLF person on.earth/honestly go where PRT
'For less than three people, where on earth did they go?'
b. Daduoshu ren daodi/jiujing qu na'er le?
Most person on.earth/honestly go where PRT
'For most people, where on earth did they go?'

It thus seems that we can indeed reduce the 'intervention' in *why*-questions to a broad phenomenon of topicalizability.

I believe the weak acceptability in (35) has a pragmatic reason. Following Kratzer [34,35], I assume that choice function variables receive their values directly from the context of utterance. If context does not readily offer a particular plurality as the value for a choice function variable, the speaker won't know which plurality to pick out with the quantifier, and oddness arises. In the case of numeral quantifiers, we are required to pick out a particular plurality bearing a specific cardinal number, which would leave the hearers with no clues if there is no further information from the context. Krifka [36] observes the same problem for the English example in (36):

(36) ??Which dishes did two boys make?
'For two boys that you select: Which dishes did each of these boys make?'

The acceptability is claimed by Krifka to be marginal. This low acceptability of *two boys*, compared to phrases such as *most boys*, follows from the fact that it places a higher requirement on the discourse structure and on hearers' efforts to infer which particular set of two boys are under discussion. Similarly, we can explain why the topical use of quantifiers containing a numeral component is harder. Without explicit context providing supporting information, it is not plausible for a naive hearer to make a partition of the relevant individuals such that one particular plurality of a given cardinality should be distinguished against other individuals.

The context-based claim I have argued above predicts that *why*-questions with witnessable numeral quantifiers should be acceptable in a plausible scenario. This seems to be indeed the case, as the following example demonstrates.[11]

(37) (A soccer coach needed a minimum of three more healthy players to fill up his squad for a match. He felt frustrated that the scheduled operations on his injured players were two months away.)
Shangyuan li de zhishao san-ge weishenme bu neng
Injured.players inside POSS at.least three-CLF why NEG can
xian shoushu?
first operate
'For at least three of the injured players, why can't they be operated on first?'

Finally, embedded questions may offer the contextual information to anchor a particular plurality [57]. I will illustrate with the example in (38) (repeated from example (6)):

[11] According to my consultants, if we use a non-partitive form *zhishao san-ge shangyuan* 'at least three injured players', the sentence is still mildly acceptable, but nowhere close to the fine judgments we are getting with the partitive quantified expression in (37). Note that Constant [15,17] also notices (without suggesting an explanation) that partitive forms of quantifiers more readily license a referential reading than non-partitive forms. At present, I do not know how to account for this, and have to leave an answer to future work.

(38) (In a report investigating employees' resignation)
Wo yijing zhidaole {chaoguo san-ge ren/zhishao san-ge ren/san-ge ren} weishenme cizhi.
I already know {more.than three-CLF person/at.least three-CLF person/three-CLF person} why resign
'I already found out for more than three people/at least three people/three people, why they resigned.'

The indirect question that serves as the complement of *found out* does not denote a question type, but rather a fact derived from a question [25,37]. Specifically, the indirect question is construed as a true answer (true resolution) to the corresponding direct question. Thus, (38) is paraphrased as follows: 'I already found out (the answer to the question of) for three people, why they resigned.' Following Rooth [50], this indirect question intuitively answers one subquestion of the overall question: 'Why did a contextually-salient set of individuals resign?' In order to answer this overall question based on the knowledge of the speaker, the question is partitioned into two contrasting subquestions. The first asks about a plurality consisting of three people, of whom the speaker has knowledge about. The other asks about 'the rest of the individuals' of whom the speaker does not provide an answer due to lack of knowledge.

3.5 Further Evidence for the Type-e Meaning of Topical Quantifiers

In this section, I present evidence that the topicality of quantifiers correlates with their monotonicity. My diagnostics are based on Constant [15,17]. First, Constant notices that only witnessable quantifiers (monotone increasing and non-monotonic) may serve as contrastive topics. In (39), I put forward Chinese data in support of Constant's claim (CT for contrastive topic, F for focus):

(39) A: Yanjiusheng-men zhu zai na'er?
Graduate.student-PL live LOC where?
'Where do the grads live?'
B: [{Daduoshu/Wu-ge/#Henshao yanjiusheng}]^{CT} zhu zai [anhesite]^{F}.
Most/Five-CLF/#Few graduate.student live LOC Amherst
'[{Most of/Five of/#Few of the graduate students}]^{CT} live at [Amherst]^{F}.'

In (39), monotone increasing quantifiers serve as contrastive topics, but monotone decreasing quantifiers cannot. If CT-marked quantifiers such as *most* only have a standard GQ reading, they would be construed as answering one of the subquestions of question A. These subquestions would be the alternatives in {*Where did most grads live? Where did a few grads live? Where did no grads live?*...}[12] This does not accord with our intuition, in which B's answer means that B has information about where a majority subset of individuals live, as opposed to the rest

[12] See Rooth [50] for a discussion of how contrastive topic-marked answer is answering a subquestion of a preceding overall question.

of the individuals about whom B has no information. If *most grads* denotes a specific plurality of individuals, then the contrasting alternatives will be between different individual grads. This seems to be exactly what (39) does. Furthermore, if CT-marked quantifiers are standard GQs, it would be mysterious why quantifiers such as *few* cannot form an answer. If we subscribe to a choice functional approach, on the other hand, the reason is obvious, since *few* cannot denote a choice-function-selected plurality. If quantifiers such as *few* lack choice-functional interpretations, then an answer in (39B) with *few* only has the standard GQ reading. If we assume that CT is simply unable to contrast quantifiers of this type, then the sentence will be ruled out.

One further piece of evidence given by Constant is that quantifiers differ in their ability to appear in equative copular constructions: In an equative construction, the two-place copula *be* equates two individual-denoting expressions. On the left side, the first argument of the copula is a type-e plurality DP. For the equative construction to be well-formed, the right argument needs also to be an individual-denoting plurality DP. Therefore, the equative construction provides yet another diagnostic on which quantifier qualifies as type-e denoting. As it turns out, the judgment patterns in (40) match well with the patterns we have seen in the contrastive topic diagnostic.

(40) [Zhan zai na'er de ren] shi [wo de xuesheng li de
Stand LOC there REL person COP I REL student inside REL
{daduoshu/wu-ge/#henshao}].
{most/five-CLF/#few}
'[Those standing over there] are [most/five/#few of my students].'

4 Conclusion

This paper develops an account of intervention effects with Chinese *weishenme* 'why' and monotone decreasing quantifiers. The empirical generalization is that monotone decreasing quantifiers cannot scope above *weishenme* at surface, with *weishenme* 'intervening' between those quantifiers and the rest of the sentence. My take on this issue is to propose a new way of looking at things. *Weishenme* is not only *in situ*, but also at the position where it, syntactically speaking, checks off the *wh*-feature, and where it, semantically speaking, is interpreted. Materials to the left can only be interpreted as topics, giving rise to a secondary speech act in the sense of Krifka [36]. Using a notion of topicality involving witnessability (in the sense of Reinhart [46]), I then derive the quantifier restriction for this position based on which determiners can lead to witnessability, thus excluding monotone decreasing quantifiers. Quantificational expressions with monotone increasing numerals, as well as bare numerals, are also not acceptable in apparent intervention configurations, unless these sentences are embedded. I argue that this is due to the lack of context in root sentences, thus leaving the choice function variables without a value. In sum, the current analysis combines relatively independently but under a theoretical perspective disparate ideas, and arrives at a novel and simple solution to a rich array of empirical facts.

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