

Deriving *Wh*-Correlatives in Mandarin Chinese: *Wh*-movement and (Island) Identity*

Sherry Yong Chen (MIT)

Current draft: October 26, 2019

Abstract

This paper reanalyses what has been named a ‘bare conditional’ in Mandarin Chinese as a *wh*-correlative. The *wh*-correlative construction shares many semantic similarities with Hindi correlatives and English free relatives, but it crucially features a pair of a pair of *wh*-phrases that must be matched in both form and number: the strict identity requirement on the two *wh*-phrases is such that neither of the *wh*-phrases can be replaced by a pronoun or a definite description, nor can the NPs inside complex *wh*-phrases differ even minimally. Motivated by this identity requirement, the present work proposes a movement-based account for Mandarin *wh*-correlatives using key ingredients including *wh*-movement, clausal A'-movement, and morphological reanalysis Fusion. I argue that the pair of identical *wh*-phrases in *wh*-correlatives are derivationally related to each other, and the construction is base-generated like an English free relative but with the *wh*-word appearing in situ inside the relative clause. The proposal has repercussions not just for the typology of correlatives, but also for our understanding of *wh*-movement in in-situ languages, and the asymmetry between *wh*-nominals and *wh*-adverbials in Mandarin.

1 Introduction

Correlatives have received a fair amount of attention in the literature (Downing, 1978; Keenan, 1985; Srivastav, 1991; Izvorski, 1996; Dayal, 1997; de Vries, 2002; Bhatt, 2003; a.o. See Lipták (2009) for an overview). The correlative construction is a type of relative clauses that involves relativization of an NP or a DP, just as in the regular English headed relative clause “Maya will buy the CD _{RC}[which is on sale]”. Unlike this English-style relative clause, however, correlatives are typically *left-adjoined*, with a corresponding *proform* – often a demonstrative phrase – in the matrix clause. This type of relative clause is said to be highly productive in Indo-Aryan languages; an example of a simple correlative construction

*Thank you to Sabine Iatridou for her guidance and for introducing me to this topic, to Danny Fox for his countless comments and insightful suggestions. I am in debt to Ömer Demirok for sharing his work with me. Additionally, I have also benefited greatly from discussions with Rajesh Bhatt, Cater Chen, Keny Chatain, Michael Kenstowicz, Filipe Hisao Kobayashi, David Pesetsky, Norvin Richards, Danfeng Wu, Stan Zompí, the audience at NELS50 and participants of the 2018 Fall Workshop in Linguistics at MIT. Judgements for Mandarin sentences reported here are all verified by at least ten native speakers from Mainland China, in particular south-eastern China where the author is from. Remaining errors are my own.

from Hindi is shown in (1), which according to Bhatt (2003) takes on the basic schema in (2):

- (1) [Jo CD sale-par hai]_i, Maya [us CD-ko]_i khari:d-egi:
REL CD sale-on BE.PRES Maya.F DEM CD-ACC buy-FUT.F
‘Maya will buy the CD that is on sale.’
(Lit. ‘[Which CD is on sale], Maya will buy that CD.’)
- (2) Simple Correlative: $[[CorCP...NP_{rel}...]] [IP...NP_{ana}...]$
a. CorCP (which contains NP_{rel})
b. IP (which contains an NP_{ana} associated with CorCP)

In (1), *jo CD sale-par hai* “which CD is on sale” is the correlative clause which contains a *wh*-word – glossed as a relative pronoun in Bhatt (2003) – and the main clause contains a demonstrative phrase *us CD-ko* “that CD” which is said to be co-referent with *jo CD* “which CD”.

Of interest to us here is the syntactic structure of such correlative constructions. In Bhatt’s (2003) seminal paper, the correlative clause is analyzed as being base-generated within the main clause and undergoing movement to an A’ position at the left periphery. Crucially, the *wh*-pronoun in the correlative clause and the demonstrative pronoun are base-generated as sisters inside the same DP; they are not derivationally related to each other.

- (3) a. Maya _{DP}[[which CD she likes] that CD] buy-FUT (*Base-generated*)
b. _{CP}[Which CD she likes], Maya _{Dem-XP}[that CD] buy-FUT (*CorCP A’ moves*)

This paper enriches the typological profile of correlatives by introducing a seemingly exotic construction in Mandarin, which I will call *wh*-correlatives. I will argue that *wh*-correlatives exhibit the signature of classic Hindi correlatives in having a *wh*-pronoun in the correlative clause, together with a corresponding *proform* in the main clause, which is another *wh*-phrase in Mandarin but a demonstrative phrase in Hindi. Furthermore, I will propose an analysis for *wh*-correlatives that makes them structurally closely related to English free relatives (FRs), which take the following form:

- (4) Maya will buy [whichever CD she likes].

Taking (4) as a starting point, an English FR will have the following structure, with the lower copy of the *wh*-phrase being deleted after *wh*-movement has occurred for the purpose of relativization:

- (5) Maya will buy [whichever CD she likes ~~whichever CD~~].

But imagine a language where the second copy fails to be deleted for some reason and, perhaps due to the failure of this deletion, the relative clause undergoes A’ movement to the left periphery,¹ resulting in the following structure:

- (6) [Whichever CD she likes], Maya will buy [whichever CD].

¹It is poorly understood why correlatives in many languages are typically fronted to the left periphery; one possible candidate responsible for this movement may be topicalization. I will return to this point in Section 3

This gives us a structure that is strikingly similar to the Hindi correlative construction we see in (3-b). The crucial difference from Hindi is that the *proform* in the matrix clause and the *wh*-phrase in the correlative clause are in a syntactic relation, which will be made clear soon. This is in fact the key characteristic of *wh*-correlatives found in languages like Mandarin.

Mandarin *wh*-correlatives such as (7) involve a second *wh*-phrase as the corresponding *proform* in the main clause:²

- (7) Ni ai chi shenme cai, wo jiu zhu shenme cai
 you love eat what.dish I JIU cook what.dish
 ‘I will cook whatever dish you love to eat.’
 (Lit. ‘[What dish you love to eat], I will cook that dish.’)

I will offer a detailed analysis for Mandarin *wh*-correlatives, arguing that the *wh*-words in these constructions are relative pronouns, rather than interrogative *wh*-expressions, and the pair of identical *wh*-phrases in *wh*-correlatives is the result of multiple spell-out of the relative pronoun and the head of the relative clause. The correlative clause as a whole is base generated in a lower position and undergoes fronting to an IP-adjoined position. This movement-based approach captures the strict identity requirement on the form of the *wh*-phrases, and is able to account for various island effects and reconstruction effects we will observe in this construction.

The correlative construction appears structurally distinct from the headed relative clauses Mandarin, which is head final and contains the relative pronoun *de* instead of any *wh*-words. However, this should not prevent one from pursuing the relativization analysis, since it has been shown in languages like Turkish and Greek, correlatives and headed relative clauses can take rather different forms (Iatridou, 2013). Furthermore, synthesizing recent findings, I will show that Mandarin *wh*-correlatives should be treated neither as a type of (*if*-)conditionals (Cheng & Huang, 1996, 2000) nor a type of *wh*-questions (Liu, 2018), but as a construction that involving correlativization, much like the correlative construction in Hindi. Additionally, they cannot receive an identity statement analysis (Crain and Luo, 2011).

This work has several implication. First, empirically speaking, correlatives are often considered to appear only in “loose” head-final languages like Indo-Aryan and free word order languages like Slavic (Keenan, 1985; Lipták, 2009; a.o.). However, modern Mandarin is commonly viewed as an SVO language³, and the existence of correlative constructions in Mandarin enriches the typological profile of relativization strategies in non-head-final languages. Second, the proposed analysis provides evidence in favor of covert *wh*-movement in Mandarin, arguing against the idea that this language has genuine *wh*-in-situ syntax. Crucially, Mandarin *wh*-nominals which are known to be immune from island violations in questions do exhibit island effects in *wh*-correlatives, and I suggest that the availability of

²Although rather uncommon, these constructions involving a pair of *wh*-phrases are also found in some South and East Tungusic languages, including Hezhen, Manchu, Nanay, Negidal, Orochi, Sibe, Solon, Udihe, Ulcha; a few Mongolic languages, e.g. Dagur and Chahar (Baek, 2016). Geographically, all of these languages are spoken either within China or at the border between China and Russia. As far as I know, Passamaquoddy is the only language that has this construction (Bruening, 2001) and is not geographically adjacent to the Mandarin-speaking area.

³Li & Thompson (1974) claim that Mandarin is undergoing a change from SVO to SOV as a result of grammaticalization of serial verb constructions, but see counterarguments from Sun & Givón (1985).

(covert) massive pied-piping is the mechanism that can account for the asymmetries between (i) correlatives and questions, (ii) *wh*-nominals and *wh*-adverbials.

The rest of the paper is organized as follows: Section 2 introduces some basic properties and phenomena of Mandarin *wh*-correlatives, further highlights the identity requirement which the present account aims to capture, and shows the similarities between Mandarin *wh*-correlatives and English FRs; Section 3 presents a movement-based analysis based on syntactic evidence, and argues against an identity statement analysis for *wh*-correlatives; Section 4 extends the discussion into correlativization in *wh*-in-situ languages as well as detecting covert *wh*-movement in Mandarin, a long-standing, unsettled issue with much debate in the literature. Section 5 argues against the identity statement analysis, a prominent alternative within the FR-based analysis camp, and further compares *wh*-correlatives with *if*-conditionals and *wh*-questions in Mandarin, showing that neither analysis is appropriate for *wh*-correlatives. Section 6 concludes with some remaining questions for future investigation.

2 Mandarin correlatives: background

The classic Hindi-style correlative construction involves a *wh*-relative pronoun and a demonstrative pronoun. This type of correlative construction is highly productive in Modern Indo-Aryan languages, most of which are considered “loose” head-final languages, although there is no evidence suggesting a definite connection between head-finality and the availability of correlatives. Example (1) is repeated below for convenience:

- (8) [Jo CD sale-par hai]_i, Maya [us CD-ko]_i khari:d-egi:
REL CD sale-on BE.PRES Maya.F DEM CD-ACC buy-FUT.F
‘Maya will buy the CD that is on sale.’
(Lit. ‘[Which CD is on sale], Maya will buy that CD.’)

Turning to Mandarin, we find a very similar construction that involves a pair of *wh*-phrases asponociated with each other in some ways. A basic example from Mandarin is given below:⁴

- (9) Ni ai chi shenme cai, wo jiu zhu shenme cai
you love eat what.dish I JIU cook what.dish
‘I will cook whatever dish you love to eat.’
(Lit. ‘[What dish you love to eat], I will cook that dish.’)

In this paper, I will argue that the construction in (9) is indeed structurally and semantically a correlative construction, despite the fact that it is commonly referred to as “bare conditionals” or “*wh*-conditionals” in the literature (Cheng & Huang, 1996; Chierchia, 2000; Xiang, 2016; Liu, 2018; a.o.), because it often *can* have a conditional paraphrase.⁵ However, recent research suggests that this construction shares the semantics of Hindi correlatives and

⁴All Mandarin examples are based on my own speech unless otherwise stated. Judgements have been verified by other native speakers of Mandarin from Mainland China.

⁵Note also that the particle JIU which often appears in *wh*-correlatives often gets glossed as ‘then’. However, the meaning contributed by JIU can be rather different from the one seen in *if*-conditionals; it may have nothing to do with any kind of causal or temporal consequence:

English free relatives (FRs) in various aspects, and exhibits properties that are challenging for a conditional-based analysis. I will return to this point in Section 5.

2.1 Basic properties of Mandarin *wh*-correlatives

The defining property of *wh*-correlatives in Mandarin is that they must contain a pair of *wh*-phrases in the two clauses, and the pair of *wh*-phrases must match in terms of form and number.⁶ Although I will be focusing on *wh*-correlatives with one pair of *wh*-phrases, it is also possible to have more than one pair, which is reminiscent of the multi-head correlative construction discussed in Bhatt (2003):

- (11) Shei_i ai chi shenme_j, shei_i jiu zhu shenme_j
 who love eat what who JIU cook what
 ‘For X and Y, s.t. X loves to eat Y, X will cook Y.’ (Mandarin)
- (12) Jis-ne_i jo_j kar-na: cha:h-a, us-ne_i vo_j ki-ya:
 REL-ERG REL do-Ger want-PERF DEM-ERG DEM do-PERF
 For X and Y, s.t. X wanted to do Y, X did Y.
 (Lit. ‘Who wanted to do what, he/she did that.’) (Hindi)

While the pair of *wh*-phrases are subject to a strict identity requirement on their form, they do not have to occur in parallel positions. For example, while the *wh*-phrases occur in parallel positions in (13) and (14), this is not the case in (15) and (16):⁷

- (13) Shei xian lai, shei jiu xian chi
 who first come who JIU first eat
 ‘Whoever/The person who comes first eats first.’ Subject-Subject
- (14) Ni xihuan shei, wo jiu piping shei
 you like who I JIU criticize who
 ‘I criticize whoever/the person that you like.’ Object-Object
- (15) Shei xian jinlai, wo jiu da shei
 who first enter I JIU hit who
 ‘I will hit whoever/the person who enters first.’ Subject-Object
- (16) Ni xihuan shei, shei jiu daomei
 you like who who JIU unlucky
 ‘Whoever/the person that you like is unlucky.’ Object-Subject

-
- (10) Ni zenme gen wo shuo de, wo jiu zenme gen ta shuo de
 you how with me say REL I JIU how with him say REL
 ‘You told me in X way, I told him exactly in X way.’

In this example, *jiu* expresses the precise manner of the saying event. This is reminiscent of Turkish marker *-sA* (appearing in the correlative clause rather than the main clause), which Iatridou (2013) argues to be a marker of *correlativity*, hence its appearance in both correlative clauses and *if*-conditionals (i.e. both are syntactically correlative constructions).

⁶A few exceptions have been reported to this requirement (e.g. Lin, 1996; Pan & Jiang, 2015), but judgements differ rather vastly among native speakers, and it is difficult to see any common patterns. I will set these few cases aside for the time being with the hope that future research will shed more light on them.

⁷These examples are modified based on Cheng & Huang (1996, pp. 127-129)

Finally, another basic property I'll introduce here is that all kinds of *wh*-words can appear in these constructions; an example for each of them is provided below:

- (17) Ni xiang qing shei, wo jiu qu qing shei.
 you want invite who I JIU go invite who
 'I will go and invite whoever/the person who you want to invite.' *Who*
- (18) Ni xihuan chi shenme, wo jiu zhu shenme.
 you like eat what I JIU cook what
 'I cook whatever/the thing that you like to eat.' *What*
- (19) Ni xihuan chi na-ge cai, wo jiu zhu na-ge cai.
 you like eat which-CL.dish I JIU cook which-CL.dish
 'I cook whichever dish/the dish that you like to eat.' *Which*
- (20) Ni xiang qu nali, wo jiu pei ni qu nali.
 you want go where I JIU accompany you go where
 'I go to wherever/the place that you want to go with you.' *Where*
- (21) Ni heshi qu dujia, wo jiu heshi lai baifang ni.
 you when go on-vacation I JIU when come visit you
 'I come visit you whenever/at the time when you go on a vacation.' *When*
- (22) Ni natian zenme huilai, wo jiu zenme guoqu.
 you that-day how come.back I JIU how go
 'I will go however/in the way you came back that day.' *How*
- (23) Ni weishenme gaoxing, wo jiu weishenme nanguo.
 you why happy I JIU why upset
 'I am upset for whatever reason/the reason why you are happy.' *Why*⁸

To wrap up, Mandarin *wh*-correlatives exhibit the identity requirement on the form of a pair of *wh*-phrases, and all kinds of *wh*-phrases may appear. In what follows, the overarching goal for our investigation of the Mandarin *wh*-correlatives is two-fold: (i) to offer a structural analysis for this construction which can capture the identity requirement; (ii) to provide an adequate treatment of the *wh*-words that appear in these *wh*-correlatives. Bearing these in mind, I will now discuss the identity requirement in more detail.

2.2 The Identity Requirement

In this section, I will first synthesize some observations that have been discussed in the literature regarding the identity requirement,⁹ and make note of a few novel observations.

The pair of *wh*-phrases is subject to a strict identity requirement on their form, as manifested in various ways. To begin with, the following well-known example from Cheng

⁸Crosslinguistically speaking, *why* rarely appears in free relatives and correlatives, especially *-ever* free relatives (i.e. **why-ever*), but note that the Mandarin *why* is morphologically and compositionally built from "for what".

⁹Literature on this Mandarin construction has been referring to the identity requirement on *wh*-phrases as "the matching effect". However, in the correlative/FR literature, the term is reserved for a different phenomenon, e.g. case-matching in Greek FRs. Throughout the paper, I will be using the term "identity requirement" consistently for the purpose of disambiguation.

& Huang (1996) shows that the second *wh*-phrase cannot be replaced by a pronoun or a definite description:¹⁰

- (24) Ni xiang qing shei, wo jiu qu qing {shei / *ta / *nage ren}
 you want invite who I JIU go invite {who / *3SG / *that-CL person}
 Intended: ‘I’ll invite whoever you want to invite.’
 → Can’t be replaced by a pronoun or a definite description

Furthermore, it is also unacceptable to replace one of the *wh*-phrases here, *shei* ‘who’, with *shenme ren* ‘what person’, even though these two *wh*-phrases seem to be semantically equivalent and can be used to ask the very same question, as far as one can tell:

- (25) Shei ai kanshu, {shei / *shenme ren} jiu qu tushuguan.
 who love read {who / what.person} JIU go library
 Intended: ‘Whoever loves to read goes to the library.’
 → Can’t be replaced by a different *wh*-phrase with the same meaning
- (26) {Shei/Shenme ren} lai le?
 {who/what.person} come PERF
 ‘Who came?’ (Interchangeable in questions)

How should the identity requirement be explained? Previous studies have focused on the mismatching cases in (24) and (25), where the entire second *wh*-phrase is replaced by something completely distinct. However, there is an aspect of the identity requirement that has been largely overlooked: where exactly does the identity requirement apply *inside* the *wh*-phrases?

A straightforward hypothesis is that the entire *wh*-phrases in *wh*-correlatives are subject to the identity requirement. This is supported by the following observations: (27) intends to replace *haizi* ‘child’ in the first *wh*-phrase with a close synonym *xiaohai* ‘child’ in the second *wh*-phrase, but this results in ungrammaticality:

- (27) *[Na-ge haizi] zai ku, [na-ge xiaohai] jiu shi e le.
 which-CL child PROG cry which-CL child JIU be hungry PERF
 Intended: ‘Whichever child is crying must be hungry.’
 → Can’t be replaced by another *wh*-phrase containing a different NP

This corroborates on earlier observations about the strict identity requirement on the form of the pair of *wh*-phrases in *wh*-correlatives, and seems to suggest that our hypothesis is on the right track.¹¹

¹⁰For some speakers, *which* seems to ameliorate the violation of this identity requirement. Also, using a psych-verb in the construction seems to often make pronoun occurrences more acceptable. I will leave the detail of these observations to be worked out in the future.

¹¹The picture is complicated as we turn our attention to degree *wh*-pronouns, which creates equatives and (sub)comparatives. With degree *wh*-pronouns like *duo* ‘how much’ and *ji* ‘how many’, only the degree *wh*-words but not their complement(s) are subject to the identity requirement, a previously unnoticed observation:

- (28) Ni shang wo duo shen, wo de xin jiu duo tong.
 you hurt me how.much deep I POSS heart JIU how.much painful
 ‘You hurt me to X-degree, my heart is painful to X-degree.’

2.3 *Wh*-correlatives are like English FRs

To motivate my analysis of the *wh*-correlatives, in this section, I show that Mandarin *wh*-correlatives and English *-ever* FRs are semantically akin, establishing the first piece of evidence based on semantic and structural properties.

A few authors have noted the similarities between Mandarin *wh*-correlatives and Hindi left-adjoined correlatives as well as English FRs. Perhaps due to the lack of *-ever* morphology, Mandarin *wh*-correlatives do not distinguish between plain FRs and *-ever* FRs, which are distinguished based on their forms in English. Just like English *-ever* FRs, Mandarin *wh*-correlatives are underspecified for number, and can receive either a unique reading or a universal reading (Jacobson, 1995; Y. Huang, 2010; Crain & Luo, 2011).¹²

- (30) Wo shuo shenme, ni jiu zuo shenme.
 I say what you JIU do what
 ‘You do the thing/whatever I say.’

There is a family of modal implications associated with English *-ever* FRs, i.e. ignorance, indifference, and free choice inferences, all of which are also found in Mandarin *wh*-correlatives (Y. Huang, 2010; Crain & Luo, 2011; Luo & Crain, 2011). For example, a salient ignorance implication arises in (31):

- (31) a. Shei xian lai, shei xian chi.
 who first come who first eat
 ‘Whoever/The person who comes first eats first.’
 b. *Ignorance*: The person who comes first eats first, but I don’t know who will be the one that comes first.

Adopting the test suite from von Stechow 2000, both Y. Huang (2010) and Luo & Crain (2011) show that (31) passes the ‘namely’ test (cf. Dayal 1997). As shown in the English example in (32), when a phrase meaning ‘namely’ (which is used to identify a referent) is being inserted in an FR, the sentence becomes unacceptable under an ignorance reading. The same holds for the Mandarin *wh*-correlative in (33):

- (32) *Whatever Mary is cooking, namely ratatouille, has tons of onions.
 (33) Shei xian lai, (*wo zhidao shi Zhangsan), shei xian chi.
 who first come I know be Zhangsan who first eat
 Intended: ‘The person who comes first - I know it’s Zhangsan - eats first.’

To further corroborate on this point, the copula test also indicates *wh*-correlatives have some ignorance implication (cf. Tredinnick, 1996; Iatridou & Varlokosta, 1998; Condoravdi,

-
- (29) Lai le [ji-wei keren], ni jiu zhunbei [duo-shuang kuaizi].
 come PERF how.many-CL guest you JIU prepare how.many-CL chopstick
 ‘X-many guests came, you prepare X-many pairs of chopsticks.’

I think my proposal will be able to accommodate these observations by assuming a null degree head is at play in relativization, but I will not go into further detail due to space limit.

¹²There is a lively debate about whether plural FRs which be analyzed as involving plural definite descriptions or universal quantification (Jacobson, 1995; Iatridou & Varlokosta (1996); Dayal, 1997; a.o.). Here I adopt the definite description analysis without argumentation; nothing in my analysis hinges on this point.

2015; a.o.). As shown in the English examples in (34), an *-ever* FR cannot be used in a copula construction if the identity of the referent is specified. The same goes for the Mandarin *wh*-correlatives in (35):

- (34) a. Whatever book Mary likes was interesting.
 b. *Whatever book Mary likes was *Language Acquisition*.
- (35) a. Ta xuanze-le shei, shei jiu hen buxing.
 3SG choose-PERF who who JIU very unlucky
 ‘Whichever girl is chosen by the emperor is very unlucky.’
 b. *Ta xuanze-le shei, shei jiu shi Anni.
 3SG choose-PERF who who JIU be Annie
 Intended: ‘Whichever girl is chosen by him is Annie.’

In addition to the ignorance implication, *wh*-correlatives also give rise to an indifference implication in some cases. To see this, notice that the preferred reading in the English FRs below doesn’t signal speaker’s ignorance but an indifference on the part of the speaker (von Stechow, 2000): in (36), the speaker could be aware of the fact that they were grabbing a screwdriver, and in (37) Zack might as well know the name of the person he voted for, but in both cases, what the sentence conveys is that the speaker did not care about the identity of the tool/person under discussion.

- (36) I grabbed whatever tool was handy.
- (37) Zack simply voted for whoever was at the top of the ballot

Similarly, in (38), the speaker could very well be *aware* of that they are going to either New York or Los Angeles, but they simply didn’t *care* which one is the actual destination:

- (38) a. Ni qu nali, wo jiu qu nali.
 you go where I JIU go where
 ‘I go wherever you go.’ (Adapted from Y. Huang, 2010, p.51)
 b. I go wherever you go, and I don’t care where it is.

Finally, a free choice implication can also be found in the following *wh*-correlative. Given the context in (39), a university administrator may say the following to Mary:

- (39) a. *Context: the university requires 50 credits for a bachelor’s degree, and Mary has already got 47 credits. To fulfill the university’s requirement, Mary has to get 3 more credits. There are three courses Mary can register for this purpose. Each course has 3 credits.*
 b. Ni xuan na-men ke, na-men ke jiu keyi rang ni biye.
 you choose which-CL.course which-CL.course then can let you graduate
 ‘Whichever course you take can let you graduate’ (Crain & Luo, 2011, p.175)

What (39) conveys is neither ignorance nor indifference: Mary could very well be *aware* of which courses are under discussion, and she could very well *care* a lot about which course she would want to take. What the sentence signals is that *any choice* of the courses under consideration will fulfil the university requirement and allow Mary to graduate.

In a nutshell, Mandarin *wh*-correlatives exhibit many semantic properties of English *-ever*

FRs. This leads to the reasonable hypothesis that the two constructions are of the same species, and calls for an analysis that can capture the similarities noted above.

3 The *Wh*-Correlative Analysis

This section offers a syntactic analysis for Mandarin *wh*-correlatives, and provides empirical evidence in support of the proposal.

3.1 Proposal

First of all, the general form of a correlative construction is adapted based on the style of Bhatt (2003), with the basic components of a Mandarin *wh*-correlative construction shown below:

- (40) Basic components of a Correlative: $[[_{CorCP}...Wh-XP_i...]]_i$ $[_{IP}...Wh-XP_i...]$
- a. CorCP (which contains $Wh-XP_i$)
 - b. IP (which contains a $Wh-XP_i$ associated with CorCP)

The structure of a simple correlative clause in (41) is base-generated as in (42):

- (41) Ni xihuan shenme, wo jiu zhu shenme
 you like what I JIU cook what
 ‘I cook whatever you like.’
- (42) $[_{IP} I [cook [_{CorCP} you [like what \emptyset] what \emptyset]]]$

The current analysis for *wh*-correlatives crucially involves two steps of movement. In **Step 1**, the *wh*-pronouns are relative pronouns that form a constituent with the head, which moves from the object position for the purpose of relativization. The relativization process involves *wh*-movement, which I examine in further detail in Section 4.

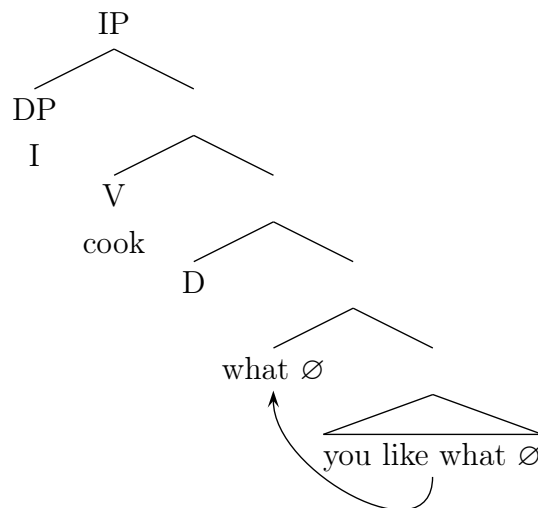


Fig 1: Step 1 involves movement of the *wh*-phrase

Next, in **Step 2**, the correlative clause, which is base-generated adjoined to a Wh-XP, A'-moves to an IP adjoined position. Crucially, after this movement has occurred, instead of having the lower copy undergoing *Deletion under Identity* at PF, I suggest that both copies of the *wh*-phrases stay at PF.

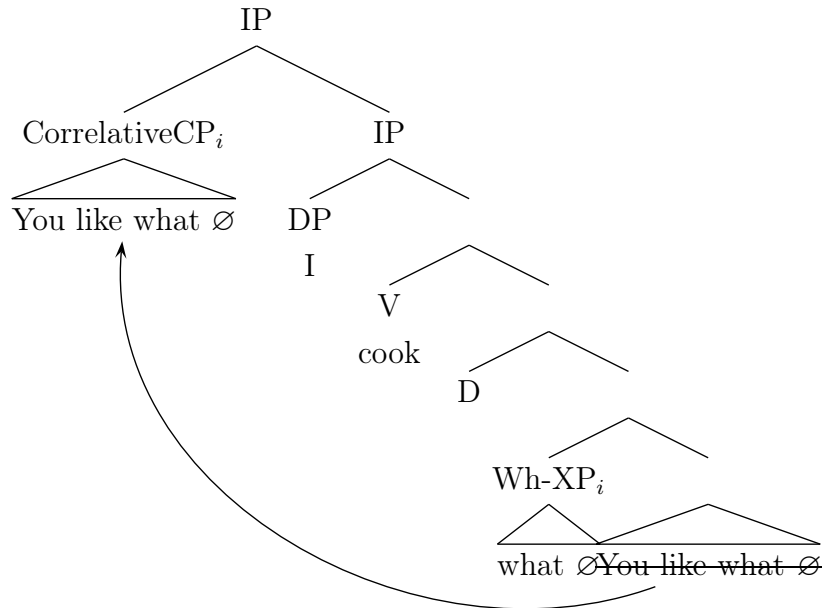


Fig 2: Step 2 involves movement of the correlative CP

Here is one possible explanation for the two occurrences of *wh*-phrases in Mandarin *wh*-correlatives: after the correlative CP has been fronted, the external head and the *wh*-pronoun undergoing Morphological Reanalysis via Fusion, fusing with the null D head at PF, which blocks the deletion of the lower copy and results in multiple copy spell-out (Nunes, 1999, 2004; Kandybowicz, 2007a). Typically, failure to delete all but a single chain link yields an unlinearizeable output (Nunes 2004). However, when a link fuses with another morpheme, it is ignored by the linearization algorithm for purposes of linearizing the chain (Nunes, 2004; Kandybowicz, 2007b). As a result, multiple copy spell-out becomes possible in virtue of Fusion, which has also been applied to the analysis of chain resolution in which multiple links of non-trivial chains are phonetically realized (Nunes, 2004; Kandybowicz, 2007b; Martins, 2007).¹³

¹³Multiple spell-out of the head of the relative clause is not restricted to Mandarin correlatives. Wenzhouese, a Wu dialect of Chinese, has what is called ‘doubling relative clause’ in which two copies of the head are spelt-out, both in the internal and the external head position; see data in Hu, Cecchetto & Guasti (2018). Thank you to XX for bringing this paper to my attention.

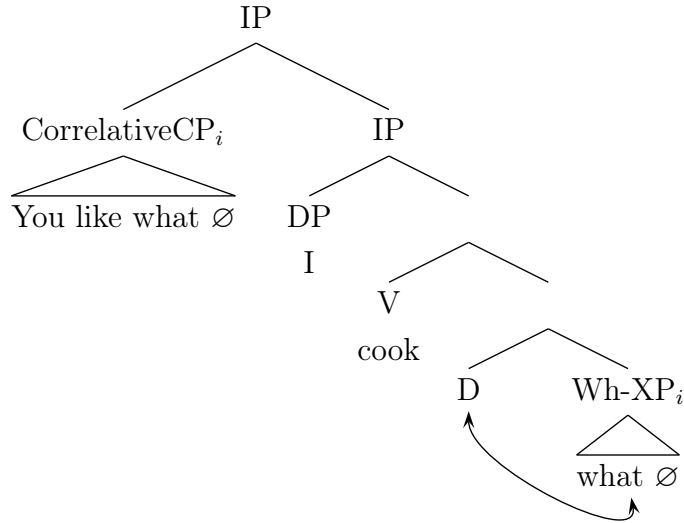


Fig 3: Fusion of the *wh*-element with the D head

There are alternative explanations for why deletion is blocked, e.g. as a result of the re-labelling process after the correlative CP is fronted.¹⁴ At this point, we have no empirical evidence to distinguish this from the analysis using Fusion, but I suggest that the latter may have one typological appeal: in the analysis of Hindi, it is unclear why the correlative is adjoined as the sister of a demonstrative, but if we assume that Fusion always occurs at this point in the formation of correlative clauses, then the fused element is spelled out as an overt demonstrative in Hindi, while it results in another occurrence of the *wh*-phrase in Mandarin. The different spell-out rules in Hindi and Mandarin can capture the typological relations between correlatives in these two languages.

Furthermore, while correlative clauses can stay inside the main clause – where they are base generated – in Hindi, they often do get fronted, a fact that is also poorly understood. In fact, the correlative clause must undergo movement in Mandarin. I suggest that this may be also be related to the multiple spell-out of *wh*-phrases in Mandarin – perhaps as a response to Distinctness Effects (Richards, 2010) which disallows the two copies of *wh*-phrases to be too close together. In contrast, in Hindi, no such thing necessarily triggers the fronting of the correlative clause, and fronting is due to topicalization, which is optional.

To recap, in the derivation of *wh*-correlatives, two steps of movement are involved: Step 1 is the movement of the *wh*-phrase for relativization, and Step 2 is the fronting of the correlative clause to the left periphery. In the next section, I will provide evidence for the movement of the correlative clause which occurs in Step 2, delaying the discussion of Step 1 until Section 4.

3.2 Evidence for movement in Step 2

Several diagnostic tests are applied to show that the correlative clause is base generated low but undergoes fronting to an IP-adjoined position, leaving behind many signatures of movement.

¹⁴I thank XXX for sharing their insight and discussing this possibility with me.

3.2.1 Island effects

I assume that island-sensitivity can be a diagnostic for movement. In (43-b), the *wh*-pronoun in the main clause shows island sensitivity. Assuming that the correlative clause is extracted out of the main clause, the following contrast can be explained by extraction out of a finite clause¹⁵ in (43-a), whereas (43-b) involves extraction out of a relative clause island:

- (43) a. Shei neng pao-guo Bo'erte, wo jiu xuanbu [shei shi diyi]
 who can run-surpass Bolt I JIU announce who be first
 'I will announce that whoever can run faster than Bolt is the No.1.'
- b. *Shei neng pao-guo Bo'erte, wo jiu mai [Mali xie de guanyu shei de
 who can run-surpass Bolt I JIU buy Mary write REL about who REL
 shu]
 book
 Intended: 'I will buy the book that Mary wrote about whoever can run faster than Bolt.'

The same pattern holds for adjunct islands. Using *shenme* 'what', island effects arise in (44-b), which traps the *wh*-word inside an adjunct island, but not in (44-a). This corroborates on the idea that the correlative clause has undergone fronting from somewhere inside the main clause.

- (44) a. Shenme kongbu, Yuehan jiu juede [shenme gaoxiao].
 what horrifying John JIU think what hilarious
 'John thinks that whatever is horrifying is hilarious.'
- b. *Shenme kongbu, Yuehan jiu [zai shenme zhongtu] shuizhao.
 what horrifying John JIU in what during fall-asleep
 Intended: 'John falls asleep during whatever is horrifying.'

3.2.2 Reconstruction effects

Wh-correlatives show reconstruction effects with respect to Principle C.¹⁶ Consider the following paradigm: (45) contains an R-expression in the object position of the correlative clause and (46) the subject position of the correlative clause. In (45-a) and (46-a), co-indexing between John and the pronoun *ta* – the subject of the main clause – is impossible or at least much degraded. By contrast, co-indexing is perfectly fine in (45-b) and (46-b), where the co-indexed pronoun *ta* is structurally lower than the second *wh*-phrase:

- (45) a. ??Shei da-le Yuehan_i, ta_i jiu taoyan shei
 who hit-PERF John 3SG JIU hate who
 Intended: 'X hit John, he will hate X.'

¹⁵According to my analysis, (43-a) involves extraction out of a sentential subject. The lack of sentential subject constraint in Mandarin has been noted since C-T. J. Huang (1982), which is taken to be correlated with Mandarin being a (subject) pro-drop language.

¹⁶The contrasts reported here regarding Principle C violation hold for the vast majority of the informants I have consulted, although a few people mentioned that these judgements become a bit delicate for them especially if the pronoun is really unstressed.

- b. Shei da-le Yuehan_i, shei jiu xiang ta_i daoqian
 who hit-PERF John who JIU to 3SG apologize
 ‘X hit John, X apologizes to him.’
- (46) a. ??Yuehan_i xiang chi shenme, ta_i jiu zhu shenme
 John want eat what 3SG JIU cook what
 Intended: ‘John wants to eat X, he will cook X.’
- b. Yuehan_i chi-le shenme, shenme jiu rang ta_i fuxie
 John eat-PERF what what JIU make 3SG diarrhea
 ‘John eats X, X gives him diarrhea.’

In the (a) sentences, the correlative clause reconstructs to a position that is lower than the subject pronoun *ta* in the main clause. Assuming that at LF, a copy of the antecedent clause is interpreted in its base position, the subject pronoun which c-commands the *wh*-phrase associated with the antecedent clause also c-commands the entire antecedent clause including the R-expression at LF, giving rise to a Principle C violation. No such violation is observed when the pronoun *ta* ‘he/she’ is in the object position of the main clause, as the (b) sentences above show, suggesting the reconstruction site is higher than the object position in these cases.

Furthermore, the following examples in (47) and (48) form a minimal pair with (45-a) and (46-a), with the pronoun *ta* now in the specifier position of the subject in the main clause. No Principle C violation arises in these cases, since the pronoun *ta* does not c-command the correlative clause that includes the R-expression at LF.

- (47) Shei da-le Yuehan_i, ta_i de mama jiu taoyan shei
 who hit-PERF John 3SG POSS mom JIU hate who
 ‘X hit John, his mom will hate X.’
- (48) Yuehan_i xiang chi shenme, ta_i de mama jiu zhu shenme
 John want eat what 3SG POSS mom JIU cook what
 ‘John wants to eat X, his mom will cook X.’

In addition, *wh*-correlatives involving a *wh*-phrase in the correlative clause also show reconstruction effects with regard to Principle A.¹⁷ The long-distance reflexive *ziji* in the correlative clause can be bound when *John* is in the subject position of the main clause (49-a), but not when *John* is in the object position (49-b).

- (49) a. Shei shanghai-le *ziji*_i, Yuehan_i jiu baofu shei
 who hurt-PERF self John JIU revenge who
 ‘John takes a revenge on whoever hurt himself (= John).’
- b. *Shei shanghai-le *ziji*_i, Shei jiu baofu yuehan_i
 who hurt-PERF self who JIU revenge John
 Intended: ‘John takes a revenge on whoever hurt himself (≠ John).’

The reconstruction effects as noted above allow us to pin down the exact position from which the correlative clause is extracted, i.e. below the subject of the main clause. This is

¹⁷For evidence that Principle A is operative in Mandarin under c-command, see for example Section 3.3.3.1 in Cheung (2008).

expected under the *wh*-correlative analysis we presented at the beginning of the section.

3.2.3 Locality in correlatives

Chen (2017) argues that in double topic constructions in Mandarin, if there are any base-generated topics, they must precede moved topics due to locality conditions, and if both topics are derived via movement, they observe the Path Containment Constraint (Pesetsky, 1982).

- (50) a. Base-generated topic > Moved topic
 b. Moved topic Top1 > Moved topic Top2 Gap for Top2 > Gap for Top1

Taking the correlative clause to be a topic,¹⁸ I show that these generalizations hold. Below are two examples showing that a base-generated nominal topic cannot intervene between a correlative clause and the main clause:

- (51) a. Jia-li de wanju, mali zai wan shenme, yuehan jiu qiang zou shenme.
 home-in NML toy Mary PROG play what John JIU rob go what

‘As for the toys at home, Mary is playing with X, John takes away X.’

- b. *Mali zai wan shenme, jia-li de wanju, yuehan jiu qiang zou shenme.
 Mary PROG play what home-in NML toy John JIU rob go what

- (52) a. Dai qu yecan de shiwu, ni xihuan shenme, wo jiu zhu shenme
 bring to picnic NML food you like what I JIU cook what
 ‘As for the food being brought to the picnic, you like X, I will cook X.’
 b. *Ni xihuan shenme, dai qu yecan de shiwu, wo jiu zhu shenme
 you like what bring to picnic NML food I JIU cook what

The following example demonstrates a PCC effect with the (potentially non-categorical) contrast going in the right direction: (53-a) observes PCC, with the topic phrase moved from the object position of the main clause, and the correlative clause moved from inside the main clause, resulting in contained paths; (53-b) violates PCC, and speakers report that they would much prefer to have the second topic pronounced in the canonical object position.

- (53) a. Jintian de zuoye_i, Mali heshi huijia, wo jiu heshi kaishi zuo t_i.
 today POSS homework Mary when come.home I JIU when start do
 ‘Today’s homework, I’ll start doing it when Mary comes home.’
 b. ?Mali heshi huijia, jintian de zuoye_i, wo jiu heshi kaishi zuo t_i.
 Mary when come.home today POSS homework I JIU when start do

¹⁸For discussions about correlatives being a topic-comment structure, see Bittner (2001), Dayal (1997), a.o. The correlative clause behaves like a topic in the sense that it is either definite or generic, and establishes an “aboutness” relation with the main clause. In Mandarin, the correlative clause can also be followed by a topic marker used typically for nominal topics. However, it is unclear to me whether the correlative clause can *always* be considered a topic, since the information it provides is not always given but can be new in the discourse. Alternatively, one may need to consider “aboutness” to be the relevant notion of topichood here.

Intended: ‘Today’s homework, I’ll start doing it when Mary comes home’

To summarize, this section offers syntactic evidence which specifically shows that the Mandarin correlative clause is based generated in a lower position within the main clause, and undergoes movement to the left periphery, as proposed in Step 2 of the analysis. It argues strongly in favour of analyzing the Mandarin construction as a correlative construction, in line with previous analyses of correlatives such as Bhatt (2003).

The structural analysis proposed here naturally explains the properties shared between Mandarin correlatives and English FRs. In the current analysis, Mandarin correlatives are syntactically base-generated just like FRs, but due to the fronting of the correlative clause and the second copy of the *wh*-phrase, which is the result of multiple spell-out, the Mandarin construction shows the descriptive signature of a correlative construction, making it structurally distinct from typical English-style FRs.

4 Relativization and *wh*-movement in Mandarin

Recall that in the current proposal for *wh*-correlatives, two steps of movement are involved: Step 1 is the movement of the *wh*-pronoun for relativization, and Step 2 is the fronting of the correlative clause. Having elaborated on Step 2, I now provide evidence for Step 1 before turning to its theoretical implications.

4.1 Movement in Step 1: *wh*-movement in correlatives

Under the current proposal, Mandarin *wh*-words in these constructions are relative pronouns rather than interrogative pronouns. These relative pronouns are built from interrogative pronouns by combining with a null +Rel morpheme. This essentially commits us to the idea that Mandarin *wh*-pronouns undergo movement for relativization, resulting in lambda abstraction and deriving the predicate base needed for the relative clause construction, which ultimately gets shifted into a definite description via a null D:

- (54) a. $[[what]] = \lambda x. x \text{ is inanimate}$
 b. $[[what\lambda_1 youlike_1]] = [\lambda x. \text{you like } x \ \& \ x \text{ is inanimate}]$
 c. $[[D[what\lambda_1 youlike_1]]] = [\iota x [\text{you like } x \ \& \ x \text{ is inanimate}]]$

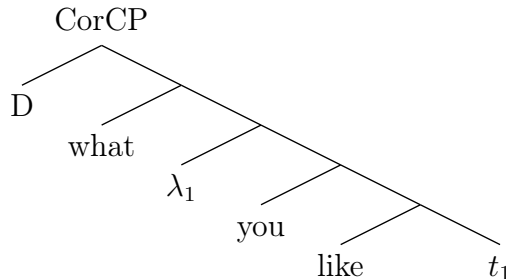


Fig 4: Interpreting the *wh*-pronoun via lambda abstraction

One concern related to this treatment of the *wh*-phrases is that they are never involved in any other form of relativization in Mandarin such as headed relative clauses (Liu, 2016, 2018). A typical, headed relative clause in Mandarin is introduced by *de*:

- (55) Yuehan hen xihuan Mali xie de shu.
 John very like Mary write REL book
 ‘John really likes the books that Mary writes.’

However, as mentioned earlier, we know independently that headed relative clauses can be structurally rather distinct from headless ones, e.g. in languages like Turkish and Greek, and such structural differences alone do not preclude the possibility that multiple relative pronouns exist in Mandarin: one dedicated for adnominal headed relative clauses and the other for FRs/correlatives.

More importantly, we have argued that these *wh*-correlatives in Mandarin are built via relativization, which involves movement. This step of movement of the *wh*-pronoun (Step 1) featured above requires *wh*-movement to be available in Mandarin, which is by itself a matter of controversies; there has been a long-standing debate regarding whether or not covert *wh*-movement is operative in Mandarin *wh*-questions (Huang, 1982; Xu, 1990; Lin, 1992; Aoun & Li, 1993; Cole & Hermon, 1994; Shi, 1994; Cheng, 1997; Soh, 2005; Tsai, 1999, 2014; see Cheng (2009) for an overview).

Here I argue that *wh*-correlatives provide additional evidence in favor of the availability of *wh*-movement in Mandarin. The key argument comes from island effects that show up when a *wh*-pronoun is trapped inside an island in the correlative clause.¹⁹ In (56-b), the *wh*-nominal *shenme* ‘what’ is inside an adjunct phrase, incurring an island violation:

- (56) a. Ni bei shenme shoushang, wo jiu bikai shenme
 you PASS what injure I JIU avoid what
 Intended ‘I will stay away from whatever thing that injured you.’
 b. *Ni [zai shenme zhongtu] shoushang, wo jiu bikai shenme
 you in what during injure I JIU avoid what
 Intended ‘I will stay away from whatever thing it is during which you got injured.’

Assuming that the constituent formed by the *wh*-pronoun and the relative clause head undergoes raising to an external position, the ungrammaticality in (56b) can be explained as a result of extraction out of an adjunct island in the correlative clause.

Further evidence for the movement of the *wh*-phrase and the fronting of the correlative clause can be seen from violations of the coordinate structure constraint (Ross, 1967). For example, (57) shows that it is not possible to have one of the *wh*-pronouns inside a conjunctive phrase, either in the correlative clause or in the main clause (Cheung, 2006, p. 153):

- (57) a. *Zhangsan xihuan shei, Lisi jiu taoyan [shei he Mali].
 Zhangsan like who Lisi JIU hate who CONJ Mary
 Intended: ‘Zhangsan like X, Lisi hates X and Mary.’
 b. *Zhangsan xihuan [shei he Mali] , Lisi jiu taoyan shei.
 Zhangsan like who CONJ Mary Lisi JIU hate who
 Intended: ‘Zhangsan like X and Mary, Lisi hates X.’

However, the *wh*-pronoun can ATB-move out of a coordinate structure in the correlative clause (Lin, 1999, p. 585) without incurring any island violations:

¹⁹See also some related data independently reported in Cheung (2006).

- (58) Shenme *t* bijiao you jinian jiazhi erqie women ye mai-de-qi *t*, women
 what more have memorial value and we also buy-can-afford we
 jiu song shenme.
 JIU give what
 ‘We give (as a gift) whatever has more memorial value and we can afford.’

This paradigm naturally follows if we assume that the *wh*-phrases in (57a-b) are both sub-constituents inside a coordinate structure, and if an extraction occurs out of a coordinate structure, a CSC violation in *wh*-correlative involving coordination is expected.

The island effects in the correlative clause as noted above provide evidence for the movement in Step 1, further corroborating on the current proposal of *wh*-correlatives. More importantly, this analysis also raises a general question regarding relativization strategies in *wh*-in-situ languages. I will argue, with reference to Demirok’s (2017) typology of relativization strategies in *wh*-in-situ languages, that *wh*-correlatives provide further evidence for Mandarin as a language with (covert) *wh*-movement.

4.2 Correlativization strategies in *wh*-in-situ languages

Demirok (2017) notes that in *wh*-in-situ languages, *wh*-correlatives are quite common while FRs are extremely rare. Turkish, for instance, has no FRs that take the following form:

- (59) Ben [Sue-nun ne pisir-digin-i] biliyorum/ *yedim
 I Sue-GEN what cook-REL-3SG-ACC know/ *ate
 ‘I know/*ate what Sue cooked.’ (Turkish)

The rarity of FRs in in-situ languages even led Cecchetto & Donati (2015, p. 50) to conclude that in-situ *wh*-FRs are non-existent. Such disproportionate distribution is surprising, given that both constructions are canonically taken to involve movement for relativization.

To address this issue, Demirok (2017) proposes a typology that treats *wh*-in-situ as a non-uniform phenomenon: in what he calls Type I languages, e.g. Tsez, covert (and overt) *wh*-movement can provide the semantic base for forming FRs via lambda abstraction, whereas in Type II languages, e.g. Turkish, genuine *wh*-in-situ cannot. Specifically, in genuine *wh*-in-situ languages, interrogative pronouns denote alternatives, and there is no resort to movement. The Hamblin denotation of a question, a set of propositions, is derived within a genuinely in-situ *wh*-syntax, which is why in these languages, no predicate base is built that can be used to form a *wh*-FR.

Correlatives, on the other hand, can be built on either interrogative or relativization structures; a language lacking *wh*-movement may use the interrogative strategy to build correlatives (Demirok, 2017).

- (60) a. *Relativization strategy*
 [_{CorCP} ... Relative Pronoun ...] → a predicate
 b. *Interrogative strategy*
 [_{CorCP} ... Interrogative Pronoun ...] → a set of propositions

The key insight from Demirok’s paper is that, if the correlatives in a language are built via the interrogative strategy using Hamblin sets, they will share the same properties with *wh*-

questions. Specifically, the *wh*-words in correlatives will do exactly what they do in questions: they should be insensitive to islands but exhibit intervention effects. This is indeed the case for Turkish correlatives:

- (61) a. Mary-yi [kim-le konuş-tuk-tan sonra] mutlu gör-dü-yse-m, partiye
 Mary-ACC who-with talk-NML-ABL after happy see-PST.1SG to.party
 onu davet et-ti-m do-PST-1SG
 DEM.ACC invitation
 ‘For any x, I saw Mary happy after she talked to x, I invited x to the party.’
 b. *[Sadece John kim-i çağır-dı-ysa], partiye o geldi.
 ONLY John ACC invite-PST-SA to.party DEM came
 Intended: ‘Whoever only John invited came to the party.’

Meanwhile, if the correlatives are built via the relativization strategy, the *wh*-words will involve (covert) movement, in which case island effects are expected. As we saw briefly in Section 3.3, this is the case for Mandarin correlatives, which exhibits a rather different profile than Turkish correlatives, suggesting that correlatives in Mandarin do involve relativization derived via movement.

4.3 *Wh*-movement in Mandarin

Mandarin is a *wh*-in-situ language, but whether Mandarin has covert *wh*-movement has been a long-standing and unsettled debate. Building on previous work on *wh*-movement in Mandarin, this paper contributes to the debate by showing that several considerations regarding *wh*-correlatives suggest that *wh*-phrases do undergo movement in Mandarin.

First of all, as mentioned earlier, Mandarin *wh*-pronouns show a nominal/adverbial asymmetry with respect to island sensitivity in *wh*-questions. Huang (1982) first notes that Mandarin *wh*-nominals like *shei* ‘who’ and *shenme* ‘what’ are not sensitive to island violations, but *wh*-adverbials such as *zenme* ‘how’ and *weishenme* ‘why’ are. Here are two examples concerning *shenme* ‘what’ that appears in a RC island and an adjunct island (Huang, Li & Li, 2009, p. 263):

- (62) Ni zui xihuan [mai shenme de ren]?
 you most like buy what REL person
 ‘For which thing x, do you most like the person who bought x?’ (RC island)
 (63) Ta [zai Lisi mai shenme yihou] shengqi le?
 he at Lisi buy what after angry PERF
 ‘For which thing x, did he get angry after Lisi bought x?’ (Adjunct island)

At face value, these *wh*-nominals appear to provide counter-examples to the idea that *wh*-movement occurs in Mandarin questions. Interestingly, however, these very same *wh*-nominals are indeed sensitive to island effects in correlatives; examples involving adjunct islands and CSC are repeated below:

- (64) *Ni [zai shenme zhongtu] shoushang, wo jiu bikai shenme.
 you in what during injure I JIU avoid what
 Intended ‘I will stay away from whatever thing it is during which you got injured.’

- (65) *Zhangsan xihuan [shei he Mali], Lisi jiu taoyan shei.
 Zhangsan like who CONJ Mary Lisi JIU hate who
 Intended: ‘Zhangsan like X and Mary, Lisi hates X.’

If we take the island sensitivity *wh*-nominals in correlatives to be indicative of movement, then a natural question arises with regards to the lack of island sensitivity in questions. These different behaviors in questions and correlatives call for a closer examination of the related fact regarding the *wh*-nominals.

Second, focus sensitive operators like *only* and *even* interact with the alternatives that an interrogative pronoun projects and lead to intervention effects (Pesetsky, 2000; Beck, 2006; Cable, 2010; a.m.o). Sensitivity to intervenors is widely assumed to be a signature of genuine *wh*-in-situ. As Demirok (2017) shows, Tsez, whose *wh*-elements are shown to be island sensitive (Polinsky & Potsdam, 2001), lacks intervention effects, suggesting that it has covert *wh*-movement, but Turkish which is genuinely *wh*-in-situ exhibits intervention effects:

- (66) a. Deber kin/tow sebi r-eti-x
 you.DAT EVEN/ONLY what.ABS.IV IV-want-PRES
 ‘What is it that even/only you want?’ (Tsez)
 b. (*Sadece) sen (*bile) ne istiyorsun
 ONLY you EVEN what want-2SG
 Intended: ‘What is it that even/only you want?’ (Turkish)

Mandarin *wh*-nominals show no intervention effects in questions (Aoun & Li, 1993; Soh, 2005; a.o.). The absence of intervention effects with a *wh*-nominal is consistent with its undergoing covert phrasal movement (Huang, 1982; Pesetsky, 2000).

- (67) Zhiyou/Shenzhi ni xiangyao shenme?
 ONLY/EVEN you want what
 Intended: ‘What is it that even/only you want?’

The cross-linguistic data discussed above are summarized below in Table 1:

Table 1: Comparison between Tsez, Turkish, and Mandarin

	Tsez (Type I)	Turkish (Type II)	Mandarin
Island in questions	✓	×	✓ (adv)/× (nom)
Island in correlatives	✓	×	✓
Intervention effects	×	✓	×

As we can see, Mandarin seems to pattern with Type I languages like Tsez, and it shows a very different profile from Type II languages like Turkish, suggesting that it is a language with covert *wh*-movement. However, if that is indeed the case, then why are *wh*-nominals *insensitive* to islands in Mandarin questions? Why is there such an asymmetry between *wh*-nominals and *wh*-adverbials? To this end, I discuss two possible analyses that will hopefully shed light on these questions.

The first idea is that in Mandarin, only overt movement is sensitive to islands, whereas covert movement is not. Note that overt movement such as topicalization does give rise to

island violations in Mandarin. In (68), *píjiu* ‘beer’ is a topic that is extracted from a RC island and an adjunct island, respectively:

- (68) a. **Píjiu, ni zui xihuan [mai _ de ren]?*
 beer you most like buy _ REL person
 Intended: ‘Beer, you most like the person who bought it’ (RC island)
- b. **Píjiu, ta [zai Lisi mai _ yihou] shengqi le*
 beer, he at Lisi buy _ after angry PERF
 Intended: ‘Beer, he get angry after Lisi bought it.’ (Adjunct island)

Moreover, Mandarin does allow *wh*-fronting even in questions in certain context, and when a *wh*-nominal undergoes fronting in *wh*-questions in (69-a), they do show islands, unlike their in-situ counterpart in (69-b) (Cheung, 2008):

- (69) a. **Shei, ni tingdao [Lisi zui xihuan _ de yaoyan]?*
 who you hear Lisi most like REL rumor
 Intended: ‘*Who did you hear the rumor that Lisi likes most?’ (Fronting)
- b. *Ni tingdao [Lisi zui xihuan shei de yaoyan]?*
 you hear Lisi most like who REL rumor
 ‘Who did you hear the rumor that Lisi likes most?’ (In situ)

Following this idea, if one could take the *wh*-movement inside correlatives to be overt – which is already in a rather unconventional way by itself, only in the sense that it results in multiple spell-out – then one may argue that there’s a distinction between covert and overt movement in terms of their sensitivity to island violations in Mandarin, and only the latter invokes island violations.

However, this idea is problematic for several reasons. For one thing, since *wh*-adverbials always invoke island violations in questions, does it mean that they always undergo overt movement, even when these *wh*-adverbials appear to be in-situ? Moreover, cross-linguistically, Tsez which has covert *wh*-movement in questions does show sensitivity to islands in in-situ questions. How would we account for this cross-linguistic difference? This idea about the difference between overt *vs.* covert movement seems to come with the cost of a predictive theory of islands as a reliable test for identifying movement, especially if we take cross-linguistic data into consideration.

Given these various concerns, here I suggest another idea, which essentially says that (covert) pied-piping can rescue *wh*-nominals from islands, following roughly Nishigauchi’s proposal about covert pied-piping (2012, p. 68),²⁰ and such an operation is not available for *wh*-adverbials. Recall that *wh*-nominals do not show island effects in questions:

²⁰Von Stechow (1996) raises several concerns about Nishigauchi’s proposal of “invisible” large scale pied-piping at LF, which he argues to deliver the wrong interpretation for English *wh*-questions. However, von Stechow (1996) is on board with the basic idea of having “invisible” large scale pied-piping, but instead of implementing it at LF, he advocates for a reformulation of Nishigauchi’s core ideas to be applied at “*wh*-structure”, an intermediate structure “between S-structure and LF”, which serves to address his initial concerns regarding interpretability. Since I’m mostly interested in the operation of “invisible” large scale pied-piping itself rather than which level it applies at, I’ll simply continue my discussion with reference to Nishigauchi (2012), noting its limitations whenever necessary.

- (70) Zhangsan xihuan [shei qing lai de zuojia]?
 Zhangsan like who invite come REL author?
 ‘Who is the x that invited the author Zhangsan likes?’ (*Wh-nominal: No island*)

We have also seen, however, that *wh*-nominals are subject to islands in both the correlative clause and the main clause:

- (71) a. ??Zhangsan xihuan [shei qing de zuojia], Lisi jiu taoyan shei.
 Zhangsan like who invite REL author Lisi JIU hate who
 Intended: ‘Lisi hates whoever invited the author Zhangsan likes.’
 b. ??Zhangsan xihuan shei, Lisi jiu taoyan [shei qing de zuojia].
 Zhangsan like who Lisi JIU hate who invite REL author
 Intended: ‘Lisi hates the author invited by whoever Zhangsan likes.’

Interestingly, Cheung (2006) first mentioned in a footnote²¹ that the pair of *wh*-nominals can occur in *identical* islands in each of the two clauses, without giving rise to island effects. The following two examples involve identical RC island and identical coordinate structures, respectively:

- (72) Zhangsan xihuan [shei qing de zuojia], Lisi jiu taoyan [shei qing de zuojia]
 Zhangsan like who invite REL author Lisi JIU hate who invite REL author
 ‘Lisi hates the author invited by whoever invited the author Zhangsan likes.’
 (73) Zhangsan xihuan [shei he Mali], Lisi jiu taoyan [shei he Mali].
 Zhangsan like who CONJ Mary Lisi JIU hate who CONJ Mary
 Intended: ‘Zhangsan like X and Mary, Lisi hates X and Mary.’

Given our syntactic account of the correlative construction, there is no requirement for extraction out of an island in correlative constructions with identical islands; the island containing the *wh*-phrase is the whole Wh-XP that gets pied-piped.²² Independently, clausal pied-piping involving *wh*-phrases are also attested in languages like Bengali (Simpson & Bhattacharya, 2003). In the case of Mandarin correlatives, here clausal pied-piping occurs in (72), satisfying the identity requirement and repairing the island violations observed in (71-b).

This suggestion is worth considering because it speaks directly to a general property of *wh*-movement in the language. Crucially, in Mandarin *wh*-questions, *wh*-nominals inside an island can be covertly pied-piped, hence the lack of island violation, but since no multiple spell-out occurs in questions since there is no Fusion with D, we simply do not see the result of covert pied-piping. It is only in *wh*-correlatives that we directly observe this process being operative.

By contrast, *wh*-adverbials like *how* and *why* don’t have this option of covert pied-piping. Nishigauchi (2012) discusses extensively the ungrammaticality of *wh*-adverbials inside a RC

²¹Cheung (2006) took (72) as a potential counter evidence of her analysis, but I use them as evidence in support of my proposal. The observations are attributed to Audrey Li.

²²This kind of structure can be interpreted compositionally provided that a system that can interpret pied-piping structures is in place. Demirok (2019) suggests that if *wh*-phrases are scope takers (e.g. generalized quantifiers), a predicate like [λx . there is a z such that z is human and x = the unique author z invited] can be derived, interpreting the pied-piping structure in (72). Needless to say, *wh*-phrases still need to have predicative denotations for basic cases. See Demirok (2019) for details.

island, and explains it as the result of a constraint that requires syntactic categories between the *wh*-phrase and the larger phrase containing it to be identical.²³ While further research is still needed to better understand the restriction on pied-piping of *wh*-adverbials, this line of analysis would explain the asymmetry between *wh*-nominals and *wh*-adverbials with regard to island sensitivity in questions, and achieve a unified theory of different *wh*-pronouns in Mandarin.²⁴

5 Against alternative analyses

In this section, I provide arguments against three existing analyses in the literature. First, I will argue that treating *wh*-correlatives as (*if*-)conditionals as in Cheng & Huang (1996) is inadequate. Second, I will show that an identity statement cannot be the correct syntax for *wh*-correlatives. Finally, I will engage with recent question-based analyses and suggest that they also fail to cover a lot of empirical data.

5.1 *Wh*-correlatives are not conditionals

As previously mentioned, *wh*-correlatives are sometimes referred to as “bare conditionals” or “*wh*-conditionals” in the literature, because they often can have a conditional paraphrase. Cheng & Huang (1996) propose a conditional analysis of (74), and treat the *wh*-pronouns as indefinites being unselectively bound by a covert NEC operator:

- (74) a. Shei xian lai, shei xian chi.
 who first come who first eat
 ‘If X comes first, X eats first.’
 b. $\forall x [x \text{ comes first}] \rightarrow [x \text{ eats first}]$

According to their account, the identity requirement observed in (24) and (25) is due to the *Prohibition against Vacuous Quantification* (Kratzer, 1989, p. 155) and a strong realization of the *Parallelism Constraint on Operator Binding*, formulated as follows.

- (75) Q_x [restriction] [nuclear scope]
 NEC_{*x*} [*x* comes first] [*x* eats first]

- (76) If *O* is an operator and *x* is a variable bound by *O*, then for any *y*, *y* is an variable of *O*, *x* and *y* are [α lexical].

Essentially, the second *wh*-phrases cannot be replaced by a pronoun or a definite description as in (24), because the latter are not variables and thus will violate Prohibition against Vacuous Quantification; it also cannot be replaced by a different *wh*-phrase as in (25),

²³The literature on pied-piping in general focuses on empirical observations regarding *wh*-nominals. Discussion about *wh*-adverbials is scarce, although Cable (2010) mentions that at least English doesn’t permit (massive) pied-piping by *wh*-adverbials.

²⁴Note however that some work does not pursue such a unified analysis at all, and simply takes Mandarin *wh*-nominals to be genuinely in situ while *wh*-adverbials do undergo movement; see Kotek (2019) for an overview. Postulating both mechanisms for the same language based on lexical differences may raise concerns regarding learnability, and does not seem to be able to offer a principled explanation for why languages like Mandarin – where *wh*-pronouns do not behave uniformly – are rather rare.

because this would result in the two variables being lexically different. Many subsequent works have pointed out the problems of treating these constructions as conditionals and the *wh*-phrases as indefinites. Here I summarize some key challenges for Cheng & Huang's original proposal.

5.1.1 Differences between *wh*-correlatives and (*if*-)conditionals

The first crucial difference between *wh*-correlatives and *if*-conditionals in Mandarin is that the former allows all kinds of *wh*-phrases but the latter doesn't. As shown in (77), an adjunct like *zenme* 'how' (and *weishenme* 'why') can be used in *wh*-correlatives but cannot be licensed in *ruguo* *if*-conditionals. This contrast would be surprising if (77-a) is also just a conditional construction like (77-b).

- (77) a. Ni zenme gen wo shuo de, wo jiu zenme gen ta shuo de
 you how with me say PAR I JIU how with 3SG say REL
 'You told me in X way, I told him/her exactly in X way.'
- b. **Ruguo* ni zenme gen ta shuo, ta hui hen gaoxing
 if you how with him say 3SG will very happy
 Intended: 'If you said (that) to him/her in some/any way (manner), he/she will be happy.'
 (Lin, 1998, p.248)

Second, Mandarin *wh*-correlatives require the presence of a *proform* in the main clause, which is characteristic of all correlative constructions cross-linguistically. No such requirements hold for conditionals, as shown in (78):

- (78) a. Ni xihuan shei, *(shei) jiu daomei
 you like who who JIU unlucky
 'Whoever you like is unlucky.' (Wh-Correlative)
- b. *Ruguo* ni xihuan shei, wo jiu bang ni biaobai
 if you like who I JIU help you confess
 'If you like someone, I will help you confess.' (If-Conditional)

Furthermore, although often translated as *if*-conditionals (Cheng & Huang, 1996; Chierchia, 2000; Bruening & Tran, 2006; Xiang, 2016; Liu, 2016, 2018), *wh*-correlatives cannot always be paraphrased into a conditional meaning; this "translation problem" is extensively documented in Y. Huang (2010). Crucially, the conditional paraphrase is only possible under a generic context; with episodic tense, a conditional paraphrase of the *wh*-correlative is not permitted:

- (79) a. Q: Zuotian wanshang ni chi le shenme?
 yesterday evening you eat PERF what
 'What did you eat yesterday evening?'
- b. A: Yuehan chi le shenme, wo jiu chi le shenme.
 John eat PERF what I JIU eat PERF what
 'I ate whatever John ate.'
 (≠ 'If John ate X, then I ate X too.')

Why do speakers have the intuition that the conditional paraphrase is inappropriate in

(79-b)? Lin (1996, 1998) suggests a possible explanation: while *if*-conditionals can only describe a possibility, *wh*-correlatives describe actual events. In the following examples from Lin (1998, p. 247), only (80-b) but not (80-a) commits the speaker to the truth of the first clause:

- (80) a. Ruguo shei zuotian mei jiao zuoye, ta jintian jiu bixu jiao
 if who yesterday not hand-in homework 3SG today JIU must hand-in
 ‘If someone did not hand in homework yesterday, he/she must hand it in today.’
 b. Ni zuotian gen shei yi-zu, jintian jiu hai gen shei yi-zu
 you yesterday with who one-group today JIU still with who one-group
 ‘You were in one group with X yesterday, you are still in the same group with X today.’

The contrast noted above receives a natural explanation once we view FRs and *wh*-correlatives as being of the same species. To be more precise, in both plain and *-ever* FRs, there is an existential presupposition that follows from their definite description denotation (following Jacobson’s (1995) account), and this explains the speaker’s commitment in (80-b).

5.1.2 *Wh*-words in correlatives are not indefinites

A conditional analysis of the *wh*-correlatives such as Cheng & Huang’s treats the *wh*-pronouns in this construction as indefinites that are interpreted as existentially closed variables. However, there are at least five problems for the indefinite analysis of the *wh*-pronouns in *wh*-correlatives.

The first problem is known as the licensing problem. *Wh*-indefinite in Mandarin are Polarity Sensitive Items and thus require a licenser (Lin, 1996; Bruening & Tran, 2006), such as non-factive verbs like ‘think’ (81-a), modals (81-b), negation (81-c), conditional operators (81-d), and yes/no question operators (81-e):

- (81) a. Wo *yiwei* ni kandao le shenme.
 I think you see PERF what
 ‘I thought you saw something.’ (Li, 1992)
 b. Wo mingtian *hui* qu mai ge shenme dongxi song ta.
 I tomorrow will go buy CL what thing give him
 ‘I will go to buy something for him.’ (Lin, 1998)
 c. Ta *bu* xihuan shenme.
 he not like what
 ‘He doesn’t like anything.’ (Li, 1992)
 d. *Ruguo* ni kandao shei, jiao ta lai jian wo.
 if you see who tell him come see me
 ‘If you see someone, tell him/her to come see me.’ (Cheng & Huang, 1996)
 e. Ta xihuan shenme *ma*?
 he like what Q
 ‘Does he like anything?’ (Li, 1992)

The *wh*-correlatives feature a pair of *wh*-pronouns. Under the conditional analysis, while the first *wh*-pronoun in the antecedent clause will be licensed as an indefinite by the conditional

operator, the second *wh*-pronoun essentially lacks a licenser. This immediately undermines the indefinite account of the *wh*-pronouns in *wh*-correlatives.

- (82) a. Shei xian lai, shei xian chi.
 who first come who first eat
 Conditional paraphrase: ‘If *x* comes first, *x* eats first.’

The second problem, as noted by Chierchia (2000), has to do with the the Novelty Condition. Lacking quantificational force, indefinites are assimilated to variables, and they differ from other variables (pronouns, traces, and other definite NPs) in that they introduce “novel” variables. If the *wh*-pronouns in *wh*-correlatives are genuine indefinites, both of them ought to be subject to the novelty condition. However, the second *wh*-phrase must be co-referent to the previous *wh*-phrase. We have to stipulate the following at the cost of a predictive theory of indefinites, which is undesirable:

- (83) a. *Wh*-words must introduce a novel variable in the antecedent clause
 b. *Wh*-word must introduce a non-novel variable in the consequent clause

Third, the *wh*-phrases in *wh*-correlatives exhibit certain definiteness effects. Specifically, an ordinary indefinite cannot be embedded as the complement DP in a partitive construction, known as “the Partitive Constraint” (cf. Jackendoff 1977).

- (84) one of these/the/my/*some cats

However, as Luo & Crain (2011) correctly pointed out, the *wh*-phrases in the first clause can be referentially linked to a partitive expression in the second clause:

- (85) Nage ban biaoxian hao, [nage ban de sanfenzhiyi] jiu keyi dedao
 which-CL.class perform well which-CL.class PART one.third JIU can get
 jiangli.
 reward
 ‘One third of whichever class that perform(s) well will get a reward.’ (Adapted
 from Crain & Luo, 2011, p. 167)

Relating to this observation, note that definite expressions and proper names can substitute the *wh*-phrases in *wh*-correlatives, but not lexical indefinites, as shown in (86) and (87):

- (86) Ni xihuan nage ren_i/Zhangsan, wo jiu piping nage ren_i/Zhangsan.
 you like that person/Zhangsan I JIU criticize that person/Zhangsan
 ‘You like that person/Zhangsan, I criticize him.’ (Cheung, 2007, p.163)
- (87) *Ni xihuan yige ren_i, wo jiu piping yige ren_i.
 you like one-CL person I JIU criticize one-CL person
 ‘You like a person, I criticize that person.’ (Bruening & Tran, 2006, p.51)

The definiteness effects observed above are inconsistent with the indefinite account of the *wh*-words, but they would be unsurprising under the classic analyses of FRs which treat them as definite descriptions (Srivastav, 1991; Jacobson, 1995; Dayal, 1995, 1997; Rullman, 1995; von Stechow, 2000; Caponigro, 2003; Tredinnick 2005; Condoravdi 2015; a.o.).

The next problem for the indefinite analysis is the lack of quantificational variability effects (QVE) in the presence of an adverb of quantification in front of the correlative clause (Y. Huang, 2010; Liu, 2016, 2018; contra. Cheung, 2006). Crucially, in (88), only the reading that involves quantification over occasions is acceptable; a non-verifying scenario will be *one* single occasion where, for example, out of the 10 people who arrived first, 9 of them ate first, a reading unattested in this case. Quantificational invariability of the *wh*-pronoun is surprising under an unselective binding analysis, but not under a relativization-based analysis, in which the correlative clause is closed by a maximality operator.

- (88) Tongchang, shei xian lai, shei jiu xian chi.
 often who first arrive who JIU first eat
 ‘Often, whoever arrives first eats first.’
 ≠ ‘(On this occasion, it’s often the case that) Whoever arrives first often eats first.’
 (Adapted from Y. Huang, 2010, p. 21)

Finally, there are many cases where the universal reading of *wh*-correlatives can be distinguished from the maximal definite reading. As Liu (2018, p. 111) shows, (89-a) asks the addressee to give the speaker a *d*-big shirt such that *d* is the maximal degree possessed by the shirts in the store. This reading is correctly predicted by the relativization-based analysis in (89-c), where the maximal degree is delivered by the maximality operator σ . By contrast, the unselective binding analysis in (89-b) requires that for every degree *d* such that the store has *d*-big shirts, the addressee should bring the speaker one shirt of that degree, which is an incorrect result.

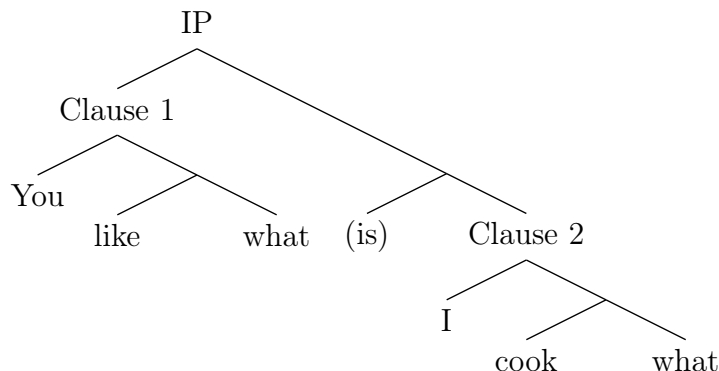
- (89) a. Ni dian-li you duo.da de chenshan, jiu na ge duo.da de gei wo.
 you store-in have how.big REL shirt JIU bring CL how.big REL give me
 ‘Give me one of the biggest shirt that your store has’
 b. $\forall d$ [your store has shirts *d*-big in size \rightarrow give me a shirt *d*-big in size]
 c. Give me a shirt σd [your store has shirts *d*-big in size]-big in size

The relativization-based analysis involving the maximality operator cannot be incorporated into the unselective binding analysis, since σ is like a definite description and cannot bind two variables at the same time as in unselective binding. In other words, given how the maximality operator is standardly defined, it is inherently incompatible with the conditional-based unselective binding analysis.

5.2 Against the Identity Statement Analysis

We have argued that the Mandarin *wh*-correlatives are semantically FRs, and have further proposed a structural analysis which assumes that the correlative clause is base generated low and undergoes fronting to an IP-adjoined position in the main clause (Step 2). Within the FR-based analysis camp, there is an alternative proposal for the structural relation of the two clauses which can be found in the literature: it argues that the *wh*-pronouns are indefinites and that the two clauses form an identity statement (Crain & Luo, 2011; Luo & Crain, 2011; Liu, 2016, 2018). The identity statement analysis essentially treats the two clauses as being connected by a null copula, with no movement involved at all. Take the Mandarin example ‘You like what, I cook what’ as an example, given an identity statement

syntax, the sentence would roughly mean ‘What you like is what I will cook’, represented as follows:



Crain & Luo (2011) discussed several reasons to consider this possibility. Identity statements in English take the following form:

- (90) A man who drinks alcopops is a man who gets a hangover.

Essentially, two identical indefinite expressions are connected by a copula. This proposal has one particular merit: while usually indefinites are subject to the novelty condition, in overt identity statements indefinites are immune to this requirement, and they are even required to be identical in form in some way, as Luo & Crain (2011) argues. However, the identity requirement in Mandarin *wh*-correlatives still cannot be fully captured under an identity statement analysis, which strongly undermines this approach. Crucially, identity statements do not require strict identity on the form of the entire DP, as the following example shows:²⁵

- (91) A toddler who runs for hours is a child who will sleep through the night.

Unlike the strict identity requirement we observe in Mandarin *wh*-correlatives, the two DPs involved in an identity statement don’t need to be entirely identical.

Additionally, assuming a structure that involves no movement of the antecedent clause faces many challenges, in light of the observations we made earlier in Section 3 and Section 4. For one thing, the reconstruction effects will be left completely unexplained given the identity statement syntax. Second, given what we know about the nominal/adverbial asymmetry in Mandarin *wh*-words (Huang, 1982), the island sensitivity we observed concerns *what* and *who*, which are said to be *insensitive* to island in questions. An identity statement syntax also has no explanation for the island sensitivity in *wh*-correlatives.

Another objection I would like to raise for the identity statement analysis concerns the distribution of the copula in Mandarin. Specifically, in a simple matrix clause, the copula is omitted if the predicate is adjectival, but the copula must not be omitted if the predicate is nominal:

- (92) a. Yuehan (*shi) hen congming.
 John COP very smart
 ‘John is clever.’

²⁵Thank you to XX for this insight.

- b. Yuehan *(shi) laoshi.
 John COP teacher
 Intended: ‘John is a teacher.’

Given Luo & Crain’s proposal, the identity statement is established between ‘what you like’ and ‘what I cook’, which for the sake of this discussion may be taken to be two DP-like constituents. Granted that it is the case, and that *wh*-correlatives were in fact identity statements, it is mysterious why the copula must be omitted here. In fact, using an overt copula to connect the two clauses in a *wh*-correlative construction is ungrammatical:

- (93) *Ni xihuan shenme shi wo zhu shenme
 you like what COP I cook what
 Intended: ‘You like X, I will cook X.’

Luo & Crain (2011) actually notes this concern, but argues that the copula is banned for independent reasons. Citing Tham (2008), they suggest that *shi* is the lexical realization of the type-shifting PRED in the sense of Chierchia (1998) and Partee (1986), and thus in equative copula sentences, both the pre-copula and the post-copula arguments are referential, i.e. of type *e*. The reason why *shi* cannot appear in these *wh*-correlatives is because the main clause of *wh*-correlatives is propositional, not of type *e*. However, *shi* can also be used to introduce propositional complement clauses; it is unclear how their explanation can be extended to an example like the following:

- (94) Wo de yuanwang shi mingnian fumu dou shenti jiankang
 I POSS wish COP next.year father.mother both body healthy
 ‘My wish is that next year, both of my parents will be healthy.’

To this end, the *wh*-correlative analysis fares better than the identity statement analysis given the syntactic considerations discussed above. In Table 2, I summarize the key properties that each proposal can and cannot account for:

Table 2: Comparison between two proposals

<i>Properties accounted for</i>	<i>Wh</i> -correlative	Identity statement
Identity requirement	✓	×
Island effects	✓	×
Reconstruction effects	✓	×
Distribution of copula	✓	×

5.3 *Wh*-correlatives are not questions

If the *wh*-words in *wh*-correlatives are not indefinites, can they simply be interrogative words? This is an alternative proposal that Liu (2018) entertains.

In Liu (2018), the *wh*-correlative construction is treated as a construction involving gen-

uine (embedded) questions.²⁶ Abstracting away from the technical details, this question-based proposal essentially argues that the two clauses in a *wh*-correlative construction both denote questions, with the pair of *wh*-words being interrogative words. Short answers to the two questions – which are extracted from propositions by applying a special answerhood operator – are taken to be individual denoting (Chierchia & Caponigro, 2013; Xiang, 2016), and are related to each other in “some special dependency relation”.

This question-based proposal has several merits. For example, since the *wh*-pronouns are interrogative words, they do not need a licenser, so there is no licensing problem to begin with. Also, since these *wh*-pronouns are existentials used in questions, they cannot be bound by adverbs of quantification, hence the lack of QVE.

However, three key problems lead me to reject this proposal. First and foremost, a question-based analysis as per Liu’s implementation has no resources to account for the identity requirement on the form of *wh*-phrases, as Liu himself admits. This fails one of the main goals of the current study. Second, with regard to the structural analysis of the *wh*-correlatives, an identity statement syntax is also adopted, and as we have discussed in the previous section, it does not adequately capture the structural relation between the two clauses. Finally and most importantly, *wh*-correlatives differ from questions in several aspects. For one thing, Mandarin *wh*-nominals such as *shei* ‘who’ and *shenme* ‘what’ are known to be *insensitive* island in questions. However, in correlatives they do exhibit island effects, a nontrivial difference:

- (95) a. Zhangsan xihuan [shei qing lai de zuojia]?
 Zhangsan like who ask come REL author?
 ‘Who is the person that invited the author Zhangsan likes?’ (*Question: No island*)
 b. ??Zhangsan xihuan [shei qing lai de zuojia], Lisi jiu taoyan shei
 Zhangsan like who ask come REL author Lisi JIU hate who
 Intended: ‘Lisi hates the person who invited the author Zhangsan likes.’ (*Correlative: Island*)

Also, although Mandarin is a language in which *wh*-phrases typically remain in situ, the *wh*-phrases can in fact be fronted to mark contrastive focus in questions (Cheung, 2008):

- (96) a. Ni zui xihuan shenme?
 you most like what
 ‘What do you like the most?’ (*Wh in-situ*)
 b. Shenme, ni zui xihuan?
 what you most like
 ‘What do you like the most?’ (*Wh-fronting*)

What is relevant for us here is that unlike the regular *wh*-questions above, fronting of one or both of the *wh*-words in correlatives is not possible:

- (97) *Shenme, ni xihuan, wo jiu zhu shenme.
 what you like I jiu cook what

²⁶Liu (2018) actually sketched two proposals, and here I only discuss his Proposal B. Proposal A is a conditional-based analysis, which I disregard for reasons discussed in the previous section.

- Intended: ‘I cook whatever you like.’ (Single Fronting in correlatives)
- (98) *Shenme, ni xihuan, shenme, wo jiu zhu.
 what you like what I jiu cook
 Intended: ‘I cook whatever you like.’ (Double fronting in correlatives)

Additionally, Mandarin have several question markers that optionally appear in *wh*-questions (e.g. *mā*), which are disallowed in the correlative clause (99). By contrast, the topic marker *dehua* which can appear in the correlative clause are banned in questions (100). The distribution of these optional question particles and topic markers distinguish *wh*-questions from *wh*-correlatives.

- (99) Ni xihuan shenme *dehua*/**mā*, wo jiu zhu shenme.
 you like what TOP/Q I JIU cook what
 Intended: ‘I cook whatever you like.’
- (100) Ni xihuan shenme (**dehua*)?
 you like what Q/TOP
 Intended: ‘What do you like?’

Table 3 summarizes the main differences between *wh*-questions and *wh*-correlatives in Mandarin:

Table 3: Comparison between Mandarin *wh*-questions vs. *wh*-correlatives

	<i>Wh</i> -Correlatives	<i>Wh</i> -Questions
Island sensitivity	✓	×
Fronting possibility	×	✓
(Sentence-final) Q marker	×	✓
Topic marker <i>dehua</i>	✓	×

6 Conclusion

In this paper, I first showed that the Mandarin *wh*-correlative construction is semantically akin to English FRs and Hindi correlatives. Based on this, I developed a structural analysis of the *wh*-correlative construction by assuming that the *wh*-phrase undergoes movement for relativization, and that the correlative clause is base-generated inside the main clause before it is fronted to the left periphery. This accounts for a wide range of empirical data including island effects and reconstruction effects.

In addition, I have argued that the identity requirement is a result of multiple spell-out of the *wh*-phrase, which undergoes movement for relativization. In cases where the *wh*-nominal is inside an island, it can be pied-piped to satisfy the identity requirement. I further postulate that the same process may apply in the formation of *wh*-questions, which may shed light on island sensitivity for *wh*-nominals observed in correlatives but the lack thereof in questions. A question that immediately arises is how we can predict which *wh*-in-situ languages can have the pied-piping operation for *wh*-phrases, and more generally what is the domain of

locality restrictions, and how it is ‘relativized’ to other parameters of the same language. Interesting as these questions are, they fall outside the scope of this paper and I will have to leave them for future research.

Before ending the paper, I would like to acknowledge a remaining question concerning the involvement of *wh*-pronouns in relativization: Mandarin doesn’t appear to have the English-style FRs that take the following form.

- (101) *Wo chi-le Mali zhu le shenme
 I eat-PERF Mary cook PERF what
 Intended: ‘I ate what Mary cooked.’

The lack of FRs in Mandarin is taken by some authors to be evidence against any FR-based analysis (e.g. Liu 2018); since *wh*-movement is possible for deriving the predicate base, why wouldn’t we expect to find FRs like the one in (101)? While this is a valid question that the current paper does not directly address, here I make two remarks. First, under the current proposal, structurally speaking *wh*-correlatives *are* FRs, with the difference being that correlative clauses cannot stay in situ but have to be fronted, perhaps as a consequence of multiple spell-out in response to some Distinctness Effects (Richards, 2010). As a result, there are only what would be descriptively characterized as correlatives but not FRs in the form of (101). Second, there is a general typological correlation between *wh*-in-situ languages and the absence of FRs. Based on an investigation of 8 language families, Demirok (2019) shows that for all in-situ languages where the *wh*-pronouns are insensitive to island effects in questions, FRs like (101) are not available. Mandarin is a language that fits this typological profile. A deeper understanding of this typological correlation may reveal something about the availability of FRs in a language that is orthogonal to the availability of *wh*-correlatives.

References

- Aoun, J. & Li, Y.-H. A. (1993). Wh-elements in Situ: Syntax or LF? *Linguistic Inquiry*, 24(2), 199–238.
- Baek, S. (2016). *Tungusic from the perspective of areal linguistics: focusing on the bikin dialect of udihe* (Doctoral dissertation, Hokkaido University, Hokkaido, Japan).
- Beck, S. (2006). Intervention effects follow from focus interpretation. *Natural Language Semantics*, 14(1), 1–56.
- Bhatt, R. (2003). Locality in correlatives. *Natural Language & Linguistic Theory*, 21(3), 485–541.
- Bittner, M. (2001). Topical referents for individuals and possibilities. In R. H. *et al* (Ed.), *Proceedings of the 11th Semantics and Linguistic Theory Conference* (pp. 36–55).
- Bruening, B. (2001). *Syntax at the edge: Cross-clausal phenomena and the syntax of Pas-samaquoddy* (Doctoral dissertation, Massachusetts Institute of Technology).
- Bruening, B. & Tran, T. (2006). Wh-conditionals in Vietnamese and Chinese: against unselective binding. In *Proceedings of the Annual Meeting of the Berkeley Linguistics Society* (Vol. 32, 1, pp. 49–60).
- Cable, S. (2010). *The grammar of Q: Q-particles, wh-movement, and pied-piping*. Oxford University Press.

- Caponigro, I. (2003). *Free not to ask: on the semantics of free relatives and wh-words cross-linguistically* (Doctoral dissertation, University of California, Los Angeles).
- Cecchetto, C. & Donati, C. (2015). *(Re)labeling*. MIT Press.
- Chen, S. Y. (2017). Movement constraints on the relative order of double topics in Mandarin Chinese. *Toronto Working Papers in Linguistics*, 38.
- Cheng, L. L.-S. [Lisa Lai-Shen]. (2009). Wh-in-situ, from the 1980s to now. *Language and Linguistics Compass*, 3(3), 767–791.
- Cheng, L. L.-S. [Lisa L-S]. (1997). *On the typology of wh-questions*. Taylor & Francis.
- Cheng, L. L.-S. [Lisa L-S] & Huang, C.-T. J. (1996). Two types of donkey sentences. *Natural Language Semantics*, 4(2), 121–163.
- Cheung, C. C. H. (2006). The syntax and semantics of bare conditionals in Chinese. In *Proceedings of Sinn und Bedeutung* (Vol. 11, pp. 150–164).
- Cheung, C. C. H. (2008). *Wh-fronting in Chinese* (Doctoral dissertation, University of Southern California).
- Chierchia, G. (1998). Reference to kinds across language. *Natural Language Semantics*, 6(4), 339–405.
- Chierchia, G. (2000). Chinese conditionals and the theory of conditionals. *Journal of East Asian Linguistics*, 9(1), 1–54.
- Chierchia, G. & Caponigro, I. (2013). Questions on questions and free relatives. In *Proceedings of Sinn und Bedeutung* (Vol. 18).
- Cole, P. & Hermon, G. (1994). Is there LF wh-movement? *Linguistic Inquiry*, 25(2), 239–262.
- Condoravdi, C. (2015). Ignorance, indifference, and individuation with wh-ever. In L. Alonso-Ovalle & P. Menendez-Benito (Eds.), *Epistemic indefinites: exploring modality beyond the verbal domain* (pp. 213–243).
- Crain, S. & Luo, Q.-P. (2011). Identity and definiteness in chinese wh-conditionals. In I. R. et al (Ed.), *Proceedings of Sinn und Bedeutung* (Vol. 15, pp. 165–179). Saarbrücken, Germany: Universaar - Saarland University Press.
- Dayal, V. (1995). Quantification in correlatives. In E. Bach, E. Jelinek, A. Kratzer, & B. H. Partee (Eds.), *Quantification in natural languages* (pp. 179–205). Springer.
- Dayal, V. (1997). Free relatives and -ever: identity and free choice readings. In A. Lawson & E. Cho (Eds.), *Proceedings of the 7th Semantics and Linguistic Theory Conference* (pp. 99–116). CLC Publications.
- De Vries, M. (2002). *The syntax of relativization*. Netherlands Graduate School of Linguistics.
- Demirok, O. (2017). Free relatives and correlatives in wh-in-situ. In *Proceedings of the 47th North East Linguistic Society*.
- Demirok, O. (2019). *Compositional paths to wh-constructions* (Doctoral dissertation, Massachusetts Institute of Technology).
- Downing, B. T. (1978). Some universals of relative clause structure. *Universals of human language*, 4, 375–418.
- von Stechow, K. (2000). Whatever. In *Proceedings of Semantics and Linguistic Theory* (Vol. 10, pp. 27–39).
- Hu, S., Cecchetto, C., & Guasti, M. T. (2018). A new case for structural intervention: evidence from Wenzhounese relative clauses. *Journal of East Asian Linguistics*, 27(3), 247–273.

- Huang, C.-T. J. (1982). Move WH in a language without WH movement. *The Linguistic Review*, 1(4), 369–416.
- Huang, C.-T. J., Li, Y.-H. A., & Li, Y. (2009). *The syntax of Chinese*. Cambridge, UK: Cambridge University Press.
- Huang, Y. (2010). *On the form and meaning of Chinese bare conditionals: not just “whatever”* (Doctoral dissertation, University of Texas at Austin).
- Iatridou, S. (2013). Looking for free relatives in Turkish. In *Proceedings of the Workshop in Altaic Formal Linguistics (WAFL) 8* (pp. 129–152).
- Iatridou, S. & Varlokosta, S. (1996). A crosslinguistic perspective on pseudoclefts. In *Proceedings of the 26th North East Linguistic Society* (Vol. 26, pp. 117–132). University of Massachusetts.
- Iatridou, S. & Varlokosta, S. (1998). Pseudoclefts crosslinguistically. *Natural Language Semantics*, 6(1), 3–28.
- Izvorski, R. (1996). The syntax and semantics of correlative proforms. In K. Kusumo (Ed.), *Proceedings of the 26th North East Linguistic Society* (pp. 133–147). Cambridge, MA: GLSA.
- Jackendoff, R. S. (1977). *X-bar syntax*. The MIT Press.
- Jacobson, P. (1995). On the quantificational force of English free relatives. In E. Bach, E. Jelinek, A. Kratzer, & B. Partee (Eds.), *Quantification in natural languages* (pp. 451–486). Springer.
- Kandybowicz, J. (2007a). Fusion and PF architecture. *University of Pennsylvania Working Papers in Linguistics*, 13(1), 8.
- Kandybowicz, J. (2007b). On fusion and multiple copy spell-out. the case of verbal repetition. In N. Corver & J. Nunes (Eds.), *The copy theory of movement* (pp. 119–150).
- Keenan, E. L. (1985). Relative clauses. In E. L. Keenan & T. Shopen (Eds.), *Language typology and syntactic description* (Vol. 2, pp. 141–170). Cambridge University Press.
- Kotek, H. (2019). *Composing questions*. Cambridge, MA: MIT Press.
- Kratzer, A. (1989). Individual-level vs. stage-level predicates. In A. K. E. Bach & B. Partee (Eds.), *Papers on quantification*. University of Massachusetts, Amherst.
- Li, C. N. & Thompson, S. A. (1974). An explanation of word order change SVO → SOV. *Foundations of Language*, 12(2), 201–214.
- Li, Y.-H. A. (1992). Indefinite *wh* in Mandarin Chinese. *Journal of East Asian Linguistics*, 1(2), 125–155.
- Lin, J.-W. (1992). The syntax of *zenmeyang* ‘how’ and *weishenme* ‘why’ in Mandarin Chinese. *Journal of East Asian Linguistics*, 1(3), 293–331.
- Lin, J.-W. (1996). *Polarity licensing and wh-phrase quantification in Chinese* (Doctoral dissertation, University of Massachusetts at Amherst).
- Lin, J.-W. (1998). On Existential Polarity *wh*-Phrases in Chinese. *Journal of East Asian Linguistics*, 7(3), 219–255.
- Lin, J.-W. (1999). Double quantification and the meaning of *shenme* ‘what’ in Chinese bare conditionals. *Linguistics and philosophy*, 22(6), 573–593.
- Lipták, A. (2009). *Correlatives cross-linguistically*. John Benjamins Publishing.
- Liu, M. (2016). Mandarin *wh*-conditionals as interrogative conditionals. In *Proceedings of Semantics and Linguistic Theory* (Vol. 26, pp. 814–835).

- Liu, M. (2018). *Varieties of alternatives: focus particles and wh-expressions in Mandarin*. Frontiers in Chinese Linguistics (Vol. 3). Singapore: Springer.
- Luo, Q.-P. & Crain, S. (2011). Do Chinese *Wh*-conditionals Have Relatives in Other Languages? *Language and Linguistics*, 12(4), 753–798.
- Martins, A. M. (2007). Double realization of verbal copies in European Portuguese emphatic affirmation. In N. Corver & J. Nunes (Eds.), *The Copy Theory of Movement on the PF Side* (Vol. 107) (pp. 77–118). John Benjamins Publishing.
- Nishigauchi, T. (2012). *Quantification in the theory of grammar*. Springer Science & Business Media.
- Nunes, J. (1999). Linearization of chains and phonetic realization of chain links. *Current Studies in Linguistics Series*, 32, 217–250.
- Nunes, J. (2004). *Linearization of chains and sideward movement*. Linguistic Inquiry Monographs (Vol. 43). MIT Press.
- Pan, H. & Jiang, Y. (2015). The bound variable hierarchy and donkey anaphora in Mandarin Chinese. *International Journal of Chinese Linguistics*, 2(2), 159–192.
- Partee, B. (1986). Noun phrase interpretation and type-shifting principles. In J. A. G. Groenendijk, D. de Jongh, & M. J. B. Stokhof (Eds.), *Studies in Discourse Representation Theory and the Theory of Generalized Quantifiers* (pp. 115–143). Dordrecht: Foris.
- Pesetsky, D. M. (1982). *Paths and categories* (Doctoral dissertation, Massachusetts Institute of Technology).
- Pesetsky, D. M. (2000). *Phrasal movement and its kin*. MIT press.
- Polinsky, M. & Potsdam, E. (2001). Long-distance agreement and topic in Tsez. *Natural Language & Linguistic Theory*, 19(3), 583–646.
- Richards, N. (2010). *Uttering trees*. MIT Press.
- Ross, J. R. (1967). *Constraints on variables in syntax*. (Doctoral dissertation, Massachusetts Institute of Technology).
- Rullmann, H. (1995). *Maximality in the semantics of wh-constructions* (Doctoral dissertation, University of Massachusetts at Amherst).
- Shi, D. (1994). The nature of Chinese *wh*-questions. *Natural Language & Linguistic Theory*, 12(2), 301–333.
- Simpson, A. & Bhattacharya, T. (2003). Obligatory overt *wh*-movement in a *wh*-in-situ language. *Linguistic Inquiry*, 34(1), 127–142.
- Soh, H. L. (2005). *Wh*-in-situ in Mandarin Chinese. *Linguistic Inquiry*, 36(1), 143–155.
- Srivastav, V. (1991). The syntax and semantics of correlatives. *Natural Language & Linguistic Theory*, 9(4), 637–686.
- von Stechow, A. (1996). Against LF pied-piping. *Natural Language Semantics*, 4(1), 57–110.
- Sun, C.-F. & Givón, T. (1985). On the so-called SOV word order in Mandarin Chinese: A quantified text study and its implications. *Language*, 61(2), 329–351.
- Tham, S. W. (2008). The semantic category of the subject NP in Mandarin specificational copular sentences. *Journal of East Asian Linguistics*, 17(1), 61–82.
- Tredinnick, V. A. (1996). On the interpretation and distribution of *ever* in english free relatives. In *Proceedings of console* (Vol. 4).
- Tredinnick, V. A. (2005). *On the semantics of free relatives with-ever* (Doctoral dissertation, University of Pennsylvania).
- Tsai, W.-T. D. (1999). On lexical courtesy. *Journal of East Asian Linguistics*, 8(1), 39–73.

- Tsai, W.-T. D. (2014). *On economizing the theory of a -bar dependencies*. Routledge.
- Xiang, Y. (2016). *Interpreting questions with non-exhaustive answers* (Doctoral dissertation, Harvard University).
- Xu, L. (1990). Remarks on LF movement in Chinese questions. *Linguistics*, 28(2), 355–383.