No! Not any NPIs:
Is there any universal rule licensing NPIs?

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1 Background

This is a continuation of a paper that I wrote in LING 461, titled *No! Not any Negative Polarity Items: NPIs, Negations, and their Distribution.* The first paper can be found here. Like this paper, the first paper grappled with the question: *In what environments are Negative Polarity Items (NPIs) licensed?* To keep continuity, I also focused on English and Mandarin Chinese data, specifically the NPI *any* for English data, and the NPI 什麼*(shén me)* for Mandarin data. This continuation of this paper is necessary, because there are environments which we see that NPIs are licensed in, but my conclusion in the first paper doesn't predict said environments as viable. In that paper, I came to the conclusion that whenever an NPI is licensed by a NEG, the NPI needs to be c-commanded by the NEG at S-Structure in order to be licensed. For example in English:

(1) John does not-NEG have any-NPI watermelons.

(2) * John does have any-NPI watermelons.

In (1) we see the NPI is c-commanded by a NEG while in (2) we see that the NPI is not c-commanded by a NEG. In Mandarin I show the same applies to NPI 什麼*(shén me)*. In Mandarin:

(3) 約翰 沒有 買 什麼 書
John not$_{NEG}$ buy any$_{NPI}$ book

John does not buy any book.

(4) 約翰 什麼 書 都 沒有 買
John any$_{NPI}$ book all not$_{NEG}$ buy
John does not buy any book.

(5) *約翰 買 什麼 書
John buy any$_{NPI}$ book
John buys any book.

In (3) and in (4) we see the NPI is c-commanded by a NEG while in (5) we see that the NPI is not c-commanded by a NEG at S-structure. In my last paper, I argued it was this relationship between the NEG and the NPI which informed the grammaticality of these sentences. I have become aware of new data that refutes my conclusion of my previous paper. Take this English sentence adapted from Swart(1998):

(6) **Swart (1998)**: A doctor who knew anything$_{NPI}$ about acupuncture was not$_{NEG}$ available.

Here, the NEG does not c-command the NPI at S-structure, and so I have decided to continue to explore the distribution of NPIs. The theory that I provide in this paper make it clear that NPI licensing should be looked at not only through a syntactic lens, but also through semantic and pragmatic lenses as well.

1.1 About NPIs

NPIs are words and phrases such as the English *any*, *ever*, or *a red scent* which show up in places frequently associated with some negative force, hence their name. It is widely accepted that NPIs need to be licensed by a trigger to be grammatical. Often, it seems that NPIs are licensed by a Negation (NEG), but this isn't always the case. NPIs also seem to often by licensed by C$_{[+Q]}$. Take these examples of English:

(7) John did not$_{NEG}$ get any$_{NPI}$ apples.

(8) * John did get any$_{NPI}$ apples.

(9) $C_{[+Q]}$ Did John get any$_{NPI}$ apples?

(10) If$_{[+Q]}$ John gets any$_{NPI}$ apples...

(11) * That$_{[-Q]}$ John gets any$_{NPI}$ apples...

As we see, the NPI is grammatical in sentences with either a NEG or a C$_{[+Q]}$. Interestingly, not all NPIs are licensed in the exact same environments. Take these examples of English using the NPIs *yet* and *any*, taken from Penka(2010):

(12) **Penka and Zeijlstra (2010)**

a. Chomsky did not talk about any$_{NPI}$ of these facts.

b. No one has talked about any$_{NPI}$ of these facts.

c. At most three linguists have talked about any$_{NPI}$ of these facts.[1]

d. Chomsky did not talk about these facts yet$_{NPI}$.

e. No one has talked about these facts yet$_{NPI}$.

f. * At most three linguists have talked about these facts yet$_{NPI}$.

Notice how in (12c) the NPI *any* is felicitous while in (12f) the NPI *yet* is not felicitous, even though the 'negative force' environment is the same. These kinds of phenomena has resulted in the theory that certain NPIs require an environment with greater 'negative force' than others to be licensed. This theory posits three basic categories of NPIs[2]:

Penka and Zeijlstra (2010) NPI licensing environments:

- **Super Strong NPIs:** These require an environment with the strongest 'negative force', and are licensed by words such as *no* and *not*.
- **Strong NPIs:** These require an environment with a weaker 'negative force', and are licensed by words such as *never* and *nobody*.
- **Weak NPIs:** These require an environment with the weakest 'negative force', and are licensed by phrases such as *at most*.

The above examples (12a) and (12d) correlate to a super strong environment, (12b) and (12e) correlate to a strong environment, and (12c) and (12f) correlate to a weak environment.

1.2 About Language Data Acquisition

In this paper, I will rely on data from English as well as Mandarin Chinese.

[1] It should be noted this is borderline ungrammatical for the native English speakers that I consulted.

[2] I have kept the very basic, core meaning of the three categories of NPIs. The very basic core meaning is all that I need for this paper. A more technical, scientific, and comprehensive explanation of the three categories can be found in Penka(2010).

1.2.1 English

For English data, I will be relying on grammaticality judgements from my parents as well as myself. We are all native speakers of English, and speak with a Pacific Northwest dialect, a dialect which differs very little from Mainstream American English. My father grew up in Pomeroy, Washington which is in Eastern Washington. My mother grew up in Seattle, Washington. I grew up on Vashon, Washington, an island just southwest of Seattle.

1.2.2 Mandarin

For Mandarin Chinese data, I will be relying on the grammaticality judgements of my classmates Andrew Yu, and Cosmo Wang. They are both native speakers of Mandarin Chinese with English as a second language. They speak Taiwanese Mandarin, a dialect of Mandarin which is spoken in Taiwan and is mutually intelligible with the Mandarin spoken in China. According to Carnie (2013), Mandarin is traditionally known as a *wh-in-situ* language. Both Andrew and Cosmo grew up in Taipei, Taiwan.

1.3 Comparing English *any* with Mandarin Chinese *shén me*

If we were to categorize English *any* and Mandarin Chinese *shén me*, they most certainly would be categorized as weak NPIs. In (12c) I show that *any* is a weak NPI. Interestingly, *shén me* can show up in more environments with less 'negative force' than English *any* can. This certainly places *shén me* as a weak NPI[3]. Take for example:

(13) 我 大概 是 被 什麼 蟲 給螫 了。
I probably be by any bug bite Asp
I probably have been bitten by some bugs

(14) * I probably have been bitten by any bugs.

As we observe, in (13) the Chinese *shén me* is felicitous while in (14) English *any* is not felicitous, implying that *shén me* is 'weaker' than *any*. It is also important to note that unlike English *any*, *shén me* can be translated as $what_{[+Q]}$. Take this example:

(15) 喬治 看 了 什麼 電影?
George watch Asp what movie

[3]Some argue that *shén me* is not an NPI because it is felicitous in many more types of environments than *any*. For the sake of this paper, I am classifying *shén me* as an NPI akin to *any*. This classification is congruent to the finding of Lin(1998).

What movie did George watch?

(16) *喬治 看了 什麼 電影。
George watch any movie
George watches any movie.

This insinuates that Mandarin is a *wh-in-situ* language, but interestingly [+Q] is an environment that weak English NPIs are licensed as well. This begs the question about whether *shén me* really is a $C_{[+Q]}$ in such an environment. I argue that it is not, but rather *shén me* is acting like an NPI.

Lin(1998) comes up with three basic types of environments which license Chinese NPIs like *shén me*. I will be adopting the basic three types of environment for the purpose of this paper. The three basic types of environments are as follows[4]:
Lin (1998) *shén me* licensing environments[5]:

- **Group A:** Lin(1998) calls these 'Negation, Questions, and If-clauses'. These are licensed in the same environment that English *any* is typically thought to be licensed, particularly the environment created by a NEG or by [+Q]. For example:

  Lin (1998) Group A:

  (17) 我 沒 買 什麼 (東西)。
  I not buy any thing
  I didn't buy anything.

  (18) 要是 什麼 人 欺負 你。。。
  if any man bully you...
  If anyone bullies you...

  (19) 他 有 提供 你 什麼 好的 意見 嗎？
  he have provide you any good opinion $C_{[+Q]}$?
  Has he provided you with any good opinions?

[4]A more comprehensive explanation is offered in Lin(1998). Many more example sentences illustrating the different environments can also be found there. These basic definitions of the environments licensing Chinese *shén me* will suffice for this paper. It should be noted that these environments also license NPI *Shei* (who/anybody), but for simplicity I am focusing on *shén me*.

[5]According to the native speakers I consulted, the data presented in Lin (1998) "sound Chinese" like they are sentences they would find in a "textbook". Therefore, although Lin never specifies, the native speakers theorize that Lin's grammaticality judgements come from Chinese Mandarin speakers rather than Taiwanese Mandarin speakers

(17)-(19) show that *shén me* is felicitous in an environment created by a NEG or by a +Q. The Group A environment is congruent to the environments that I have demonstrated in (7)-(11) above.

- **Group B:** Lin(1998) calls these 'Epistemic Modality Environments'. These are environments where the speaker relies on their world knowledge and makes non-absolute claims about their reality. For example:

  Lin (1998) Group B:

  (20) 他 {一定/大概} 是 被 什麼 是 給 耽擱了。
  he must/probably be by any thing by delay-Asp$_{Pass}$
  He must/probably have been delayed by something.

  (21) 他 像是 在 找 什麼 東西 的樣子。
  he looks-like Asp$_{Prog}$ look-for any thing seems-like
  It seems like he is looking for something.

  (22) 恐怕 他 有 什麼 話 要 說。
  afraid/maybe he have any word want say
  I am afraid that he has something to say.

  (20)-(22) show that words which convey an uncertainty about the truth value of a speaker's statement, such as *maybe* and *probably* also license *shén me*.

- **Group C:** Lin(1998) calls these "Future" Environments. These are environments that contain some type of 'future force'. For example:

  Lin (1998) Group C:

  (23) 我 明天 會 去 買 個 什麼 東西 送 他。
  I tomorrow will go buy Cl any thing give him
  I will go to buy something for him

  (24) 你 可以 先 吃 點 什麼 (東西), 可是 別 吃 太 多
  you may beforehand eat Cl any thing but don't eat too much
  You are allowed to eat something beforehand but don't eat too much.

  (25) 我 下午 打算 去 買 本 什麼 書 來 看。
  I this-afternoon plan go buy Cl what book come read
  I plan to buy some book to read this afternoon.

  (26) 過來 吃 點 什麼 吧！
  Come eat Cl any Par
  Come over to eat something!

(23)-(26) show that environments which contain a 'future force' also license *shén me*. It should be noted that this imperatives like (26) also fall in this category, as they require a future action.

2 Research Question and Hypothesis

2.1 Research Question

What conditions need to be met in order for the weak NPIs English *any* and Mandarin Chinese *shén me* to be licensed?

2.2 Hypothesis

Semantically and/or Pragmatically

The NPI requires a wide scope negation of an existential quantifier to be licensed. For the remainder of this paper, I will refer to this as "wide scope interpretation" for simplicity. For example,

(27) a. John did not eat any apples.

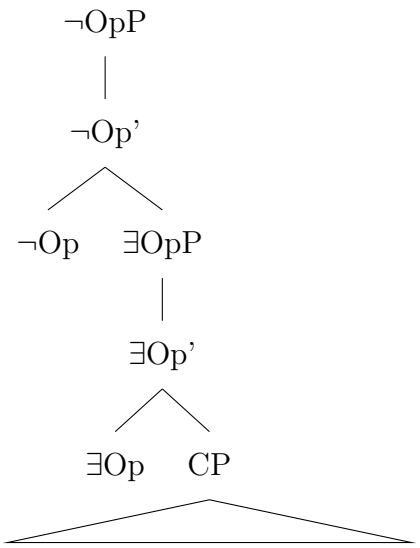
b. $\neg\exists$ x(Apple(x) $\wedge$ JohnAte(x))

When represented with first order logic (FOL), the wide scope interpretation becomes apparent. I hypothesize that the wide scope negation of the existential quantifier is what licenses *any* in (27a).

Syntactically

I propose that the NPI must be c-commanded by a Negation Operator ($\neg$Op) and an Existential Quantifier Operator ($\exists$Op) created by the wide scope interpretation at LF like so:

(28)



John did not eat any apples

3 English Testing

In this section, I will be testing the different kinds of environments that *any* is felicitous. I will test my hypothesis against the times when *any* is licensed by a Super strong environment, a Strong environment, and a Weak environment. I will also delve into when *any* is licensed by a [+Q] environment, as well testing a phenomenon which also licenses NPIs known as inverse scope.

3.1 Super Strong Environment

Recall that Super Strong Environments are the environments which have the most 'negative force' where the NPI is licensed by classical negation such as *no* or *not*. Take these sentences:

(29) a. There are no cats in any of these houses.

b. $\neg\exists x(Cat(x) \wedge InsideTheseHouses(x))$

(30) a. * There are cats in any of these houses.

b. $\exists x(Cat(x) \wedge InsideTheseHouses(x))$

(31) a. John hasn't eaten any pickles today.

b. $\neg\exists x(Pickle(x) \wedge JohnAte(x))$

(32) a. * John has eaten any pickles today.

b. $\exists x(Pickle(x) \wedge JohnAte(x))$

In (29) and (31) a wide scope interpretation is derived very easily and *any* is felicitous, while in (30) and (32) a wide scope interpretation is not readily available and *any* is not felicitous.

3.2 Strong Environment

Recall that Strong Environments are environments which have a weaker 'negative force' where the NPI is licensed words such as *never* and *nobody*. Take these sentences:

(33) a. John never ate any apples.

b. $\neg\exists x(Apple(x) \wedge JohnAte(x))$

(34) a. * John always ate any apples.

b. $\exists x(Apple(x) \wedge JohnAte(x))$

(35) a. Nobody ate any apples.

b. $\neg\exists x(Person(x) \wedge AteApple(x))$

(36) a. * Somebody ate any apples.

b. $\exists x(Cat(x) \wedge InsideThoseHouses(x))$

Like in the Super Strong Environment, a wide scope interpretation is derived very easily. (33) and (36) when translated into FOL, show wide scope interpretation.

3.3 Weak Environment

Recall that Weak Environments are environments which have the weakest negative force' where the NPI is licensed by words such as *at most*. Penka and Zeijlstra (2010) claims that *any* is licensed in weak environments, specifically by the trigger *at most*. I don't quite concur with the grammaticality judgements of Penka and Zeijlstra (2010), and neither do two other native English speakers. Thus, I propose that the Weak Environment evokes grammaticality judgements of [?] at best.

(37) **Penka and Zeijlstra (2010)**

a. ? At most two linguists have talked about any of these facts.

b. $\neg\exists x\neg\exists y\neg\exists z\neg((T(x) \wedge T(y) \wedge T(z)) \rightarrow (x = y \vee x = z \vee y = z))$

(38) a. * At least two linguists have talked about any of these facts.

b. $\exists x\exists y(T(x) \wedge T(y) \wedge \neg(x = y))$

(39) a. * Exactly two linguists have talked about any of these facts.

b. $\exists x \exists y (T(x) \wedge T(y) \wedge \neg x = y \wedge \forall x (T(z) \rightarrow (x = z \vee y = z)))$

Derivation for (37):

To derive a wide scope interpretation for (37), we will use FOL as well as set theory: Let S be the set containing all the linguists, let x, y, and z be in S, and let T be the predicate talked about these facts, i.e.

37i. $S = \{s \mid s \text{ is all the linguists}\}$

37ii. $x, y, z \in S$

37iii. Let $T =$ Talked about these facts

Thus, it follows that (37) can be translated in FOL like so:

37iv. $\forall x \forall y \forall z ((T(x) \wedge T(y) \wedge T(z)) \rightarrow (x = y \vee x = z \vee y = z))$

This says that if x,y,z are linguists talking about these facts, then at least two of those linguists must be the same linguist. This appears to contradict my hypothesis which requires a wide scope interpretation. But it is possible to derive a wide scope interpretation by applying this equivalence between a universal quantifier and a existential quantifier:

37v. $\forall x P(x) \leftrightarrow \neg \exists x \neg P(x)$

Thus it follows that we can interpret 37 as:

37vi. $\neg \exists x \neg \exists y \neg \exists z \neg ((T(x) \wedge T(y) \wedge T(z)) \rightarrow (x = y \vee x = z \vee y = z))$.

Here, we see a wide scope interpretation is available and the licensing of *any* is possible according to Penka and Zeijlstra (2010).

Derivation for (38) and (39):

Unlike (37), (38) and (39) cannot get a wide scope interpretation where the licensing of *any* is not possible. (38) when translated into FOL:

(38i) $\exists x \exists y (T(x) \wedge T(y) \wedge \neg (x = y))$

This says that there is (at least) an x, and a y, who are linguists and talking about these facts, and that these linguists are not the same linguist.

Just as (38) cannot get a wide scope interpretation, neither can (39). (39) when translated into FOL:

39i. $\exists x \exists y(T(x) \wedge T(y) \wedge \neg x = y \wedge \forall x(T(z) \rightarrow (x = z \vee y = z)))$

This says that there is an x, and a y, who are linguists and talking about these facts, and that if an arbitrary linguist is talking about these facts they are either the x, or the y (therefore there are exactly two linguists).

I believe that the grammaticality judgement discrepancy between the native speakers that I tested and Penka and Zeijlstra (2010) lies in the difficulty in deriving a wide scope interpretation. I believe this sentence is grammatical for some and not for others because a wide scope interpretation does not lend itself right away.

3.4 [+Q] Environment

Here I test the [+Q] environment, triggered by questions as well as $C_{[+Q]}$.

(40) a. {If/Whether$_{[+Q]}$} John ate any apples...

b. $\neg\exists x(Apple(x) \wedge Ate(John, x)) \vee \exists x(Apple(x) \wedge Ate(John, x))$

c. $\neg\Box\neg\exists x(John(x) \wedge Ate(John, x))$

(41) a. * That John ate any apples...

b. $\exists x(Apple(x) \wedge Ate(John, x))$

(42) a. $C_{[} + Q]$ Did John eat any apples?

b. $(\exists x(John(x) \wedge Ate(John, x))) \vee (\neg\exists x(John(x) \wedge Ate(John, x)))$

c. $\neg\Box\neg\exists x(John(x) \wedge Ate(John, x))$

(43) a. * $C_{[} - Q]$ John eats any apples.

b. $\exists x(John(x) \wedge Ate(John, x))$

Clearly, (41) and (43) do not have a wide scope interpretation which explains their ungrammatically. But unlike the previous English environments, [+Q] neither entail existence nor non-existence. Thus, neither (40) nor (42) have a wide scope interpretation, they have a wide scope disjunction. This seems to contradict my hypothesis that *any* is licensed by a wide scope negation of an existential quantifier. Instead, we can derive a wide scope interpretation through Modal Logic:

Derivation for (40) and (42):
(40) and (42) when represented with Modal logic ($\Box$) necessary and ($\Diamond$) possibly, we get a wide scope interpretation which scopes over the whole clause:
Let θ be existence of apples that John ate, i.e.

(40;42i) $\theta = \exists x(John(x) \wedge Ate(John, x))$

Thus (40) and (42) are represented as follows:

(40;42ii) $\neg\Box\neg\theta$

(it is not necessarily true that there does not exist an apple John ate)[6]

Substituting $\exists x(John(x) \wedge Ate(John, x))$ in for θ we get:

(40;42iii) $\neg\Box\neg\exists x(John(x) \wedge Ate(John, x))$

This is not quite a wide scope negation of an existential, but the negation of the existential still holds scope over the clause we see above. I argue that this scope of the negation of the existential is what licenses (40) and (42) and lends grammaticality.

It should be noted that it appears to take much more "work" in a [+Q] environment to derive a wide scope interpretation than a weak environment. Thus, we would predict that a [+Q] environment would get poorer grammaticality judgements than a weak environment, but this is not the case. Pragmatically, a weak environment implies existence of an entity, while a [+Q] environment neither implies nor denies existence of an entity. For example, "at most two apples" seems to imply existence of an apple, while "if there are apples..." neither implies nor denies the existence of an apple. Therefore, a wide scope interpretation is more readily available for a [+Q] environment when compared to a weak environment, explaining why [+Q] environments get consistently better grammaticality judgements than weak environments.

3.5 Inverse Scope

(44) **Swart (1998)**

a. A doctor who knew anything about acupuncture was not available.

b. $\neg\exists x(Doctor(x) \wedge$ knows about acupuncture(x) $\wedge\, available(x))$

Derivation for (44):

It should be noted that this sentence is ambiguous. This could have:

44a. A wide scope interpretation:

44a.i. There was not any doctor (out of the set of doctor we are referring to) who knew anything about acupuncture available.

[6]Notice that one could represent (40) and (42) as $\Diamond\theta$ (it is possible that there exists an apple that John ate), due to this equivalence in Modal Logic: $\Diamond\theta \leftrightarrow \neg\Box\neg\theta$.

44a.ii. $\neg\exists x(Doctor(x) \wedge KnowsAboutAcupuncture(x) \wedge Available(x))$

44b. A narrow scope interpretation:

44b.i There was an arbitrary doctor (out of the set of doctors we are referring to) who knew anything about acupuncture available (and there could be other doctors who know anything about acupuncture who are available).

44b.ii $\exists x(Doctor(x) \wedge KnowsAboutAcupuncture(x) \wedge \neg Available(x))$

After consulting two native speakers of English, they consistently interpreted (44) as (44a.). This shows that pragmatically, this sentence is interpreted with a wide scope interpretation. I argue that this wide scope interpretation licenses *any*[7].

4 Mandarin Testing

In this section I will be testing Group A, Group B, and Group C environments against Chinese NPI *shén me* to test my theory that a wide scope interpretation licenses an NPI. I will mostly use Modal Logic, the same logic I used in 3.4 ([+Q]) environments above to derive a wide scope interpretation.

4.1 Group A

Recall that Group A was an environment created by NEG or [+Q], and is congruent to environments licensing English *any*.

(45) a. 我 今天 沒 吃 什麼 酸黃瓜。
I today not eat any pickles
I didn't eat any pickles today.

b. *?我 今天 有 吃 什麼 酸黃瓜。
I today have eat any pickles
I have eaten any pickles today.

(46) 除非 我 看 見 什麼 鳥，。。。
unless I have see any birds
Unless I have seen any birds...

[7]It should be noted that 44b.i as an interpretation is possible, while my hypothesis predicts it wouldn't be. Currently, I don't have a good explanation for why this is possible. Also it should be noted that this ambiguity still exists without the NPI *anything*, and thus the interpretations of 44a. and 44b.i do not follow from the inclusion of an NPI.

(47) 我 在 做 什麼$_{what}$？
I Asp$_{[Prog]}$ do what
What am I doing?

As these environments are congruent to environments licensing English *any*, I have already shown that we can get a wide scope interpretation. We see from English subsections 3.1 (Super Strong Environment), 3.2 (Strong Environment), and 3.4 ([+Q]), a wide scope interpretation is possible for the licensing of the NPI *shén me*. As predicted, *shén me* is felicitous in Group A where a wide scope interpretation is easily derived.

4.2 Group B

Recall that Group B was an environment where the speaker made claims about their world knowledge that they were not certain about. Thus, these can all be expressed with Modal Logic[8]:

(48) a. 他 可能 發生 什麼 事 了。
he maybe happen some event Asp
Maybe something happened to him.

b. $\neg\Box\neg\theta$ where $\theta = \exists x(Event(x) \wedge Happen(x, him))$

c. $\neg\Box\neg\theta \leftrightarrow \neg\Box\neg\exists x(Event(x) \wedge Happen(x, him))$

(49) a. 我 懷疑 世界上 有 什麼 免費的 午餐。
I doubt on-the-world have any free lunch
I doubt there is any free lunch.

b. $\neg\Box\neg\theta$ where $\theta = \exists x(Lunch(x) \wedge Free(x))$

c. $\neg\Box\neg\theta \leftrightarrow \neg\Box\neg\exists x(Lunch(x) \wedge Free(x))$

(50) a. 我 覺得 你 有 什麼 秘密。
I think you have any secret
I think you have some secrets.

b. $\neg\Box\neg\theta$ where $\theta = \exists x(Secret(x) \wedge Have(you, x))$

c. $\neg\Box\neg\theta \leftrightarrow \neg\Box\neg\exists x(Lunch(x) \wedge Free(x))$

(51) a. *?我 知道 世界上 有 什麼 免費的 午餐。
I know on-the-world have any free lunch

[8] 48-50 can also be translated as such: It is not necessarily true that there exists an x such that P(x). i.e. $\neg\Box\neg\theta$. We arrive at $\neg\Box\neg\theta$ through this Modal Logic equivalence: $\Diamond\theta \leftrightarrow \neg\Box\neg\theta$ like we did in section 3.4.

I know there is any free lunch.

b. $\Box\theta$ where $\theta = \exists x(Lunch(x) \wedge Free(x))$

c. $\Box\theta \leftrightarrow \Box\exists x(Lunch(x) \wedge Free(x))$

(52) a. *我 覺得 世界上 有 什麼 免費的 午餐。
I believe/think on-the-world have any free lunch
I believe/think there is any free lunch.[9]

b. $\Box\theta$ where $\theta = \exists x(Lunch(x) \wedge Free(x))$

c. $\Box\theta \leftrightarrow \Box\exists x(Lunch(x) \wedge Free(x))$

As we see, when translated with Modal Logic, when we get a wide scope interpretation like we got in English subsection 3.4 ([+Q]) we get grammatical sentences, while when there is not a wide scope interpretation, we don't get grammatical sentences. It is this wide scope interpretation which I argue licenses *shén me*.

4.3 Group C

Recall that Group C environments are environments which have some sort of 'future force'. Thus, there is implied uncertainty because the speaker does not know what will happen in the future. Either the event they describe will happen or it won't. Just like Group B, Group C can be represented with Modal Logic using the same logic as section 3.4 and Group B.

(53) a. 我 會 買 些 什麼 食物 來 吃。
I can buy Cl any food come eat
I will buy some food to eat.

b. $\neg\Box\neg\theta$ where $\theta = \exists x(Food(x) \wedge WillBuy(I, x))$

c. $\neg\Box\neg\theta \leftrightarrow \neg\Box\neg\exists x(Food(x) \wedge WillBuy(I, x))$

(54) a. *我 正 在 買 什麼 食物。
I is $\text{Asp}_{[Prog]}$ buy any food
I am buying some food.

b. $\exists x(Food(x) \wedge Buy(I, x))$

(55) a. *我 買 什麼 食物。
I buy any food

[9]Although 覺得 is traditionally translated as "think" in English, the context within which this sentence is understood lends a wide scope interpretation for native speakers of Mandarin. They felt like the "sureness" or "certainty" of the existence of free lunch was almost the same as is conveyed by 知道 *know* in (51).

I buy some food

b. $\exists x(Food(x) \wedge Buy(I, x))$

(56) a. 一起　　去 做 點 什麼 吧！
Together go do Cl any　Par!
Let's do something!

b. $\neg\Box\neg\theta$ where $\theta = \exists x(Thing(x) \wedge WillDo(we, x))$

c. $\neg\Box\neg\theta \leftrightarrow \neg\Box\neg\exists x(Thing(x) \wedge WillDo(we, x))$

(57) a. 我 可能　會　先　　做 點 什麼。
I　maybe can beforehand do Cl any
I may do something beforehand.

b. $\neg\Box\neg\theta$ where $\theta = \exists x(Thing(x) \wedge WillDo(I, x))$

c. $\neg\Box\neg\theta \leftrightarrow \neg\Box\neg\exists x(Thing(x) \wedge WillDo(I, x))$

(58) a. 你　應該　做 點　什麼（事）。
you should do any (event)
You should do something.

b. $\neg\Box\neg\theta$ where $\theta = \exists x(Thing(x) \wedge WillDo(you, x))$

c. $\neg\Box\neg\theta \leftrightarrow \neg\Box\neg\exists x(Thing(x) \wedge WillDo(you, x))$

(59) a. 如果 你　覺得 無聊　就　去 玩　點　什麼 (東西)。
if　you think bored then go play any
If you are bored, go play with something.

b. $\neg\Box\neg\theta$ where $\theta = \exists x(Thing(x) \wedge WillPlay(you, x))$

c. $\neg\Box\neg\theta \leftrightarrow \neg\Box\neg\exists x(Thing(x) \wedge WillPlay(you, x))$[10]

For Group C, a wide scope interpretation like in subsection 3.4 ([+Q] Environment) is available when the sentences have a 'future force' and thus *shén me* is felicitous. Sentences without a 'future force' like (54) and (55) where *shén me* is not felicitous lose their wide scope interpretation.

5 Conclusion

Throughout the exploration of English NPI *any* and Chinese NPI *shén me*, we see that the NPI needs to be within the semantic and/or pragmatic scope of a negation of an existential quantifier, i.e.

[10]Note that 59 is still translated the same way in modal logic because either you will go play with something or you won't, irregardless of whether or not you are bored.

(60) $\neg\exists x P(x)$

I referred to this phenomenon as wide scope interpretation throughout this paper. Because of these findings, I propose that syntactically, there is a Negation Operator ($\neg$Op) and an Existential Quantifier Operator ($\exists$Op) which must c-command the NPI in order for the NPI to be licensed (see (28)). We saw that oftentimes the wide scope interpretation needed to be derived using both FOL as well as Modal Logic.

6 Discussion of Conclusion and Methods

It is important to note that I explored two weak NPIs, and that an exploration of different NPIs, especially Strong and Super Strong NPIs, is necessary to posit any Universal Rule by which NPIs are licensed. With that said, I believe that this paper holds merit, and that research should be conducted further in this vein.

6.1 Half-Proposal for Universal Rule Licensing NPIs

It also important to note that my theory does not limit the environments that make NPIs felicitous, and is therefore unable to explain why Chinese NPI *shén me* is felicitous in more environments than English NPI *any*, nor does my theory explain why there are Weak, Strong, and Super Strong NPIs which are licensed by different environments. That being said, it is clear that the environments that license Super Strong NPIs also license Strong NPIs and Weak NPIs, and that the environments that license Strong NPI also license Weak NPIs.
Put into set theory:

(61) Let $A = \{x \text{ is an environment} \mid x \text{ licenses Weak NPIs}\}$

(62) Let $B = \{x \text{ is an environment} \mid x \text{ licenses Strong NPIs}\}$

(63) Let $C = \{x \text{ is an environment} \mid x \text{ licenses Super Strong NPIs}\}$

A is a subset of B which is a subset of C, i.e.

(64) $A \subseteq B \subseteq C$

Throughout this paper, we have shown that A, B, and C can all have wide scope interpretations. Thus, let the Universe U be the set of all the environments which can have a wide scope interpretation[11], where sets A, B, and C are all subsets of U, i.e.

[11] I am inclined to believe that U is a finite set, merely because NPIs are not grammatical everywhere. There seems to be a limit to the amount of environments that NPIs are licensed in.

(65) Let $U = \{x \text{ is an environment} \mid x \text{ has a wide scope interpretation}\}$

(66) Let $A \subseteq B \subseteq C \subseteq U$

Thus, it follows that A, B, C are in the power set of U, i.e.

(67) $A \in P(U)$, $B \in P(U)$, $C \in P(U)$.

6.2 For Further Research

All the environments within the set of environments licensing an (arbitrary) NPI have wide scope interpretations. Therefore, the set of environments where an (arbitrary) NPI is felicitous must be in the power set of U. i.e.

(68) $X = \{x \text{ is an environment} \mid x \text{ licenses an (arbitrary) NPI}\}$

(69) $X \in P(U)$

What dictates which environments an (arbitrary) NPI is felicitous in and which environments an (arbitary) NPI is not felicitous in, (i.e. which $X \in P(U)$ an (arbitrary) NPI needs to be in to be felicitous), I am unable to explain currently. I suspect that it has to do with the semantics of the NPI itself. If this holds true, then it could mean that there is no true Universal rule for NPIs, as each NPI would have a different set of environments in U that they would be felicitous in (i.e. $X_1 \in U$ would license NPI_1, $X_2 \in U$ would license NPI_2, $X_3 \in U$ would license NPI_3, etc).

7 Appendix

Here is data that I considered but did not include in the main portion of my paper:

7.1 Group A

(70) 你 要 買 什麼?
you are buy what
What are you going to buy?

(71) 我 覺得 他 沒 什麼 機會 贏。
I think he not any chance win
I think that he doesn't have any chance of winning.

7.2 Group B

(72) 我 懷疑 他 沒 什麼 錢 可以 還。
I suspect he not any money can pay-back
I suspect/doubt that he doesn't have any money to pay back.

(73) *我 覺得 他 有 什麼 機會 贏
I believe/think he have any chance win
I think he have some chance to win.

7.3 Group C

(74) 你 可以 做點 什麼 (事)。
You can do any event
You can do something.

(75) *你 正 在 做點 什麼 (事)。
You is $\text{Asp}_{[+prog]}$ to-do any event
You are doing something.

(76) *我 買 些 什麼 食物 來 吃。
I buy some any food come eat
I buy some food to eat.

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