

The licensing contexts of polarity-sensitive adverb *sīhuó* ('no matter what') and *duànrán* ('flatly'): A force-dynamic analysis

Abstract. Previous studies have shown that the distribution of weak NPI adverbs like *sīhuó* ('no matter what') cannot be fully explained by the existing hypotheses about the general licensing conditions of NPIs like downward entailment. However, a satisfactory explanation for the distribution of these adverbs in Mandarin has not yet been achieved. In this article, I attempt to apply the force-dynamic model (Talmy, 1988) to explain the licensing contexts of the weak NPI adverbs *sīhuó* ('no matter what'). I propose that the lexical meaning of *sīhuó* carries a conceptual structure that involves a confrontation between two forces at the physical or conceptual level. Predicates or contexts that also carry such a semantic structure can license *sīhuó* while others may not. This analysis provides a unifying explanation for the occurrence of the adverb *sīhuó* in both negative contexts and some affirmative sentences. The force-dynamic analysis may also be applied to the distribution of other polarity-sensitive adverbs such as *duànrán* ('flatly') and *xīnrán* ('happily').

Keywords: polarity sensitivity; adverb; force dynamics; verbs of implicit negation

1. Introduction

Some adverbs in Mandarin present the characteristics of polarity sensitivity. They can be treated as weak NPIs (Zwarts, 1998; Zheng, 2017). One example of this kind is the adverb *sīhuó*. It is a compound juxtaposed by *sǐ* ('die') and *huó* ('live'), whose literal meaning is 'die and/or live' and conventional meaning is 'no matter how; anyway'. Previous studies have pointed out that *sīhuó* shows a preference for negative contexts (Wang, T., 2007; Wang, W., 2016; 2017). For example, in Wang W.'s (2016) corpus study, 187 sentences out of 213 examples of *sīhuó* (87.8%) in her sample are negative sentences. *Sīhuó* is treated as a 'weak' NPI because it can occur in affirmative sentences with some restrictions. Zheng (2017:133) classifies the affirmative sentences which allow the occurrence of *sīhuó* into three classes. The first one is that the main predicate of the sentence is a modal verb denoting volition or ability, such as *yào* ('want'), *yuànyì* ('be willing to') or *gǎn* ('dare'), etc. The second case is when the main predicate denotes a certain kind of actions of the body, such as *sīhuó zhuài zhe yìgēn shéngzi* ('hold on to a string firmly'). The third case is called 'other contexts', such as *sīhuó tóng niáng zài yídào* ('stay with mother no matter what').

There are still some puzzles regarding the contexts that allow the occurrence of *sīhuó*. Firstly, *sīhuó* can modify verbs which denote body actions such as *zhuài* ('drag'), *lā* ('pull'), or *zhuā* ('grasp'), such as *sīhuó lā-zhù wǒ* ('pull me back desperately'), which are apparently affirmative contexts. Zheng (2017:133) argues that such use of *sīhuó* is separate and different from the NPI use of the word. However, we intuitively feel that there seems to be certain conceptual relatedness between the use where *sīhuó* modifies a verb of body action and the use where the adverb is used in a negative context. How can we explain such a potential connection?

Secondly, the existing theories cannot explain why some verbs of implicit negation (VINs) can license *sīhuó* while others cannot. For example, both *jùjué* ('refuse') and *lǎnde* ('don't feel like; don't bother to') are strong verbs of implicit negation that can license some strict NPIs such as NPI-minimizers (Xu, 2022). However, *jùjué* is fully compatible with *sīhuó* while *lǎnde* is not:

(1) 張三死活 {拒絕/??懶得} 跟李四見面。

Zhāngsān sǐhuó {jùjué / ??lǎnde} gēn Lǐsì jiànmiàn.

Zhangsan dead-live refuse not feel like with Lisi meet

(‘Zhangsan refused to meet Lisi no matter what.’ / ‘Zhangsan didn’t feel like meeting Lisi no matter what.’)

Meanwhile, verb of implicit negation *fàngqì* (‘give up’) sounds odd with *sǐhuó* while the apparent ‘positive’ counterpart *jiānchí* (‘persist’) is compatible with the adverb:

(2) 他死活 {??放棄/堅持} 參加比賽。

Tā sǐhuó {??fàngqì / jiānchí} cānjiā bǐsài.

3SG dead-live give up persist participate match

(‘He gave up/persisted participating in the match no matter what.’)

Some mainstream theories about the licensing contexts of NPIs such as downward entailment (Ladusaw, 1979) or nonveridicality (Giannakidou, 2011) seem not be able to explain the semantic property shared by all contexts of *sǐhuó*. Wang. W (2017) argues that *sǐhuó* is used in a context where the subject disobeys the volition of other participants in the context, or the subject’s action is contrary to a certain fact, which the author generalizes as ‘unconditional confrontation’¹. The context that licenses *sǐhuó* must fulfill the requirement that there is a conflict between the agent’s intention and the request or expectation of other people. I found Wang. W’s (2017) idea of ‘confrontation’ is inspiring in that it captures the characteristic of the force-dynamic relationship between the subject and the others in the context where *sǐhuó* can occur. However, Wang. W (2017) did not develop such an idea to explain all the distribution of *sǐhuó*. Also, the semantic content of such a ‘confrontation’ has not been elaborated in Wang. W (2017).

In the following section, I will show that the three uses of *sǐhuó* generalized by Zheng (2017) can actually be explained by a unifying force-dynamic schema, which involves a confrontation between the subject and another participant in the context at a physical or mental level. The puzzles mentioned above will also be explained by the matching relationship of the force-dynamic schema between the predicates and the adverb. I will also briefly discuss how such a force-dynamic analysis may apply to the distribution of other polarity-sensitive adverbs such as *duànrán* (‘flatly’) and *xīnrán* (‘happily’) in Section 3.

2. A force dynamic analysis of the distribution of NPI-adverb *sǐhuó*

2.1 The force dynamics model






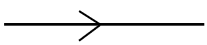

From the point of view of the collocational approach to polarity sensitivity, certain semantic features of the licenser and the licensee (NPIs) must match for the NPI to be licensed. Following this view, the (un)acceptability of the co-occurrence of a VIN and an NPI depends on whether the **conceptual structures** or **semantic frames** of both sides match. Such a claim is built upon an assumption that both a predicate and an NPI will evoke a certain conceptual structure or semantic frame in their lexical meanings. In this section, I attempt to apply the force dynamics model to analyze the conceptual structure of *jùjué* (‘refuse’) and related VINs as well as adverbial NPIs such as *sǐhuó*. As I will illustrate below, the distribution of adverbial NPIs in Mandarin can be better generalized by the force dynamics model.

The force dynamics model was developed by Leonard Talmy in his classic article published by

¹The original Chinese term is ‘無條件對抗義’.

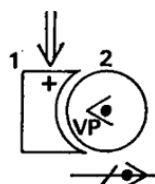
Cognitive Science in 1988. ‘Force dynamics’ refers to ‘how entities interact with respect to force’ (Talmy, 1988). It is a generalization of the linguistic notion causality and analyzes causality by decomposing the causal event into finer primitives and elaborates how different participants interact with each other within a framework of force interaction. It applies diagrams to visualize the dynamic relations between different linguistic forces in a given setting. The purpose of force dynamics is to serve as “a fundamental notional system that structures conceptual material pertaining to force interaction in a common way across a linguistic range: the physical, psychological, social, inferential, discourse, and mental-model domains of reference and conception” (Talmy, 1988:50). The force dynamics (FD) modal has been applied in many subfields in grammar and semantics including causality, modality, and verb aspects and causal structures (Croft, 2012), among others, to provide cognitive and functionally based representations of the conceptual structures of certain linguistic categories. Some basic components and their denotations are presented below; they are adapted from Talmy (1988).

Table 1: Basic components and their meanings in the force dynamics model

a. Force entities	 Agonist (Ago) Antagonist (Ant)
b. Intrinsic force tendency	Toward action:  Toward rest: 
c. Balance of strengths	The stronger entity:  The weaker entity: 
d. Resultant of the force interaction	Action:  Rest: 

For example, the force dynamics of ‘stop/prevent’ is presented as follows:

Figure 1 The force dynamics of *stop/prevent* (Talmy, 1988:63)



Example: *stopped the gas from flowing out*. (‘1’-the agent of *stop*; ‘2’-the gas)

The schema above can be interpreted as follows by translating the information of each basic component: (a) **the Agonist**: a certain event or situation (denoted by VP, represented by entity 2 in the schema) is about to take place (in the status of towards-action); (b) **the Antagonist**: the entity ‘1’ conducts a certain action to block the (potential) action of the entity 2; (c) the **interactions** between the two forces: the force of entity 1 is stronger than the force of entity 2, which results from a status of rest of entity 2.

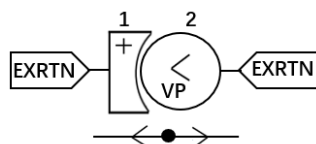
Apart from the typical causal events involving physical movements of entities, the force dynamics analysis can also be applied to the ‘inter-psychological’ or ‘social’ force interaction, which Talmy calls ‘sociodynamics’. More complex patterns of force dynamics, such as the force dynamics of lexical items like *try*, *refuse*, or *finally*, can be captured by the force dynamics model. In the following sections, I will apply the force dynamics model to explain the (in)compatibility between the weak NPI adverb *sīhuó* and

the predicates or contexts that may license it.

2.2 The force dynamics of *sīhuó*

According to Talmy (1988), adverbs such as *finally* project a force dynamic schema as a predicate does. This shows that certain information regarding force dynamics may be encoded in the lexical meaning of adverbs as well. Following this assumption, I propose the force dynamics of *sīhuó* as follows:

Figure 2: The force dynamics of the context that licenses *sīhuó*



The key feature of this force dynamics script is that there are two forces from two opposite directions confronting each other (represented by the two arrows of opposite direction at the bottom). The resultant of the force interaction is towards 'rest' at the moment because of the continuity of the confrontation, as marked by the black dot on the line at the bottom. The resultant should be 'rest' rather than 'action' because *sīhuó* is used to modify the state of confrontation, while the exact result of the confrontation is not yet clear to the speaker. The box of 'EXRTN' ('exertion') is added to indicate a great physical or mental effort from both sides, which can be marked as a feature [+exertion]. Now I will illustrate how this force dynamics schema explains various uses of *sīhuó*, ranging from physical to conceptual force interaction.

2.3 The force dynamics of the licensing contexts of *sīhuó*

2.3.1 Physical force-confrontation denoted by body action verbs

The force dynamic schema above explains the relatively 'concrete' sense of *sīhuó* when it directly modifies verbs denoting body actions such as *zhuài* ('drag'), *lā* ('pull'), or *zhuā* ('grasp'). For example:

- (3) 拿的時候他還不樂意，覺得我搶他收藏了，死活拽著一個紅頭繩就是不撒手，跟我搞爭奪。(CCL\六六 溫柔啊溫柔)

Ná de shíhòu tā hái bú lèyì, juéde wǒ qiǎng tā shōucáng le, **sīhuó** **zhuài**
take DE when 3Sg even not happy think 1Sg rob 3Sg collection LE desperately pull
zhè yí-gè hóngtóushéng jiùshì bù sǎ shǒu, gēn wǒ gǎo zhēngduó.

Cont one-CL red-head-string be not let go with 1Sg make contest

'He was not happy when (I) took it. He thought that I was taking his collection. He pulled on a red string desperately and didn't let go, intending to struggle with me.'

- (4) 我就要去拼命，跟他一個對一個，誰也別活算了。我爸爸死活拉住我。(CCL\馮驥才作品)

Wǒ jiù yào qù pīnmìng, gēn tā yí-gè duì yí-gè, shuí yě bié
1Sg then want go fight with 3sg one-CL versus one-CL who also don't
huó suàn le. Wǒ bàba **sīhuó** **lā-zhù** wǒ.

alive let it be Perf 1sg father desperately pull-ZHU 1sg

'I wanted to fight with him, one versus one, even if neither were to survive. My father

pulled me [back] desperately.’

In actions like ‘drag’ or ‘pull’, there are two forces from opposite directions acting along a straight line. The strength of each force is roughly equal to the other so a balanced state is maintained.

Such a physical relation between two forces matches perfectly with the force dynamic modal of *sīhuó* proposed above. This explains why verbs denoting body actions such as ‘drag’, which is apparently a non-negative context, can allow the occurrence of *sīhuó*. If we define the licensing environments of *sīhuó* following the monotonicity thesis (such as downward-entailment) or by purely formal criteria (such as the presence of negative elements), we may have to exclude this collocation between *sīhuó* and body-action verbs from the normal NPI use of the adverb; Zheng (2017:133), for example, defines such use of *sīhuó* as separate and different from the NPI use of the word. From the perspective of force dynamics, however, the use of *sīhuó* at the physical level and the mental level can be explained uniformly.

2.3.2 Conceptual force-confrontation denoted by negative words and verbs of implicit negation

2.3.2.1 Negative words

The force-confrontation encoded by *sīhuó* also extends to the mental or conceptual level. Since negative assertions are usually made against a certain (affirmative) assumption that has been established in the context (Givón, 1978), negation can be understood as a blocking force which stops a pre-existing force from moving forward. In the example below, *sīhuó* modifies a negative verbal phrase marked by the negative *bù* (‘not’). In this case, the *Agonist* (‘2’ in Figure 2) represents the suggestion/request/assumption put forth by other persons, and the *Antagonist* (‘1’ in Figure 2) is foregrounded as the subject who stands against this abstract force. The resultant state of a negative sentence should be ‘rest’, which indicates the non-occurrence of the state of affairs. This explains why negative *bù* (‘not; do not intend to’) can license *sīhuó*.

(5) 他死活不去。

Tā sīhuó bù qù.
3SG no matter what not go

‘He doesn’t want to go (there) no matter what.’ (It implies that somebody asked the subject to go repeatedly but he kept refusing to do so.)

2.3.2.2 Volitional modal verb

The force-dynamic schema shown in Figure 2 also explains why *sīhuó* can be licensed by volitional modality such as *yào* (‘want’). In the following example, *sīhuó* modifies an affirmative phrase which denotes the agent’s intention to do something. In this situation, the positions of ‘1’ and ‘2’ of the force-dynamic schema in Figure 2 are reversed. Namely, the subject of the sentence now represents the *Agonist* who intends to act against the *Antagonist* who tries to stop the subject from doing a certain thing.

(6) 他死活要去。

Tā sīhuó yào qù.
3SG no matter what want go

‘He wanted to go no matter what.’ (It implies that the subject wanted to go but somebody else tried to stop him from going; and the subject insisted on going. Such a situation may repeat several times.)

This shows that predicates denoting both positive and negative volition are compatible with the force dynamics schema of *sīhuó*. The difference lies in which role of the force interaction (*Agonist/Antagonist*) is foregrounded as the subject.

It should be noted that the volitional modal verb *yào* ('want') alone is not sufficient to license *sīhuó*. In the first example below, the pre-assumption that 'he should go' has been established in the context, and the intention of the agent ('he') is in accordance with the suggestion by other participants, which fails to fulfill the requirement of 'confrontation', leading to the unacceptability of the sentence. In the second example, however, the pre-assumption is that other participants in the context think that 'he should not go', while the intention of the agent ('he') went against the others' suggestions. In this context, the semantic requirement of confrontation between the subject and others' assumption is matched and the sentence is grammatical.

(7) a. #我們勸他去，他死活要去。

#wǒmen quàn tā qù, tā sǐhuó yào qù.
 1PL advise 3Sg go 3SG no matter what want go
 (Lit: 'We advised him to go. He wanted to go no matter what.')

b. 我們勸他別去，他死活要去。

wǒmen quàn tā bié qù, tā sǐhuó yào qù.
 1PL advise 3Sg don't go 3SG no matter what want go
 'We advised him not to go. He wanted to go no matter what.'

The above examples indicate that only when the agent's volition is against the expectation from others can *sīhuó* be felicitous, which is captured by the encountering of two forces in the force-dynamic schema.

2.3.2.3 Verbs of implicit negation

In this section, I will explain why certain predicates may or may not license *sīhuó*. Firstly, I will explain why verb of 'refuse' can license *sīhuó* while verb of 'accept' cannot. Secondly, I will explain why some verbs of implicit negation such as *lǎnde* ('not feel like doing; not bother') cannot license *sīhuó*. Thirdly, I will explain the apparent 'flip-flop' phenomenon where the verb with negative meaning *fàngqì* ('give up') sounds odd with *sīhuó* while the positive verb *jiānchí* ('persist') can co-occur with the adverb.

2.3.2.3.1 'Refuse/deny' versus 'promise/admit'

Apart from the negative word *bù* ('not; do not want to'), verbs of refusal such as *jùjué* ('refuse') and *fǒurèn* ('deny') can license *sīhuó*. The positive counterparts such as *dāyìng* ('promise') and *chéngrèn* ('admit') seldom co-occur with *sīhuó*. For example:

(8) 張三死活 {拒絕/??同意/??答應} 與李四見面。

Zhāngsān sǐhuó {jùjué/??tóngyì/??dāyìng} yǔ Lǐsì jiànmiàn.
 Zhangsan no matter what refuse agree promise with Lisi meet
 ('Zhangsan refused/agreed/promised to meet Lisi no matter what.')

(9) 張三死活 {否認/*承認} 自己與李四見過面。

Zhāngsān sīhuó {fǒurèn/*chéngrèn} zìjǐ yǔ Lǐsì jiàn guò miàn
 Zhangsan no matter what deny/admit self with Lisi see- Exp. -face
 ‘Zhangsan denied/admitted that he had met Lisi anyway.’

According to Talmy (1988), the force dynamics of predicates such as *refuse* involve a complex structure of phases. He proposes two additional factors for this kind of complex pattern, namely, the ‘phase’ and the ‘factivity’. The factor of ‘phase’ refers to ‘the location along the temporal sequence at which focal attention is placed’. The factor ‘factivity’ refers to the ‘occurrence or non-occurrence of portions of the sequence and the speaker’s knowledge about this’ (Talmy, 1988). In other words, ‘factivity’ is about the resultant of the force interaction implicated by the lexical meaning of the word. I propose a simplified version of the script of the force dynamics of *jùjué* (‘refuse’) in Mandarin based on Talmy (1988) with minor revisions as follows:

Figure 3: The force dynamics of *dāyìng* (‘promise’)

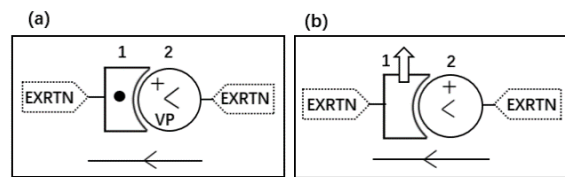
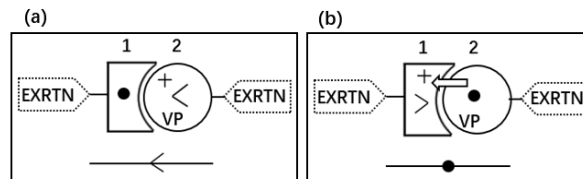


Figure 4: The force dynamics of *jùjué* (‘refuse’)



The force dynamics schemas above reflect the fundamental difference between the REFUSE-type and the PROMISE-type predicates. While both of them express the agent’s volition regarding a request or an invitation for conducting a certain action (which is reflected by the characteristic that the first phase (a) of the force dynamics of *dāyìng* and *jùjué* are the same), PROMISE **allows** the force of others’ expectation to go through while REFUSE **blocks** the motion of such expectation. The verb-pair *fǒurèn* (‘deny’) and *chéngrèn* (‘admit’) share a parallel asymmetrical relationship as ‘refuse-accept/promise’. The difference lies in that it is an accusation of doing something rather than a request is put towards the subject in the case of ‘admit-deny’.

2.3.2.3.2 *Jùjué* (‘refuse’) versus *lǎnde* (‘not feel like; not bother’)

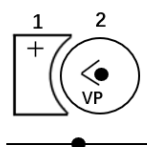
The second puzzle is why some verbs of implicit negation like *lǎnde* cannot license *sīhuó*. In Figure 4, I proposed an optional ‘exertion’ feature for the force dynamics of *jùjué*. This is motivated by the fact that refusal may or may not involve a great effort or determination from the subject. Unlike *jùjué*, there is no strong confrontation between the subject’s volition and the others’ expectation in the case of *lǎnde* (‘do not feel like; not bother’). *Lǎnde* implies that the reason for someone’s not feeling like doing something is due to the subjective reason of the agent herself rather than some external and objective reasons (such as the lack of certain conditions). Semantically speaking, the subject of *lǎndé* has an absolute advantage over the opponent in the force interaction. In addition, no ‘exertion’ feature is proposed for the force

dynamics of *lǎndé* because this feature is incompatible with its lexical meaning. For example, it sounds odd to modify *lǎndé* by an expression which denotes great effort or determination of the subject, while such an expression is compatible with *jùjué*:

- (10) 他下了很大決心 {拒絕/?懶得} 參加比賽。
 Tā xià le hěn dà juéxīn {jùjué /?lǎndé} cānjiā bǐsài.
 3SG make Perf very big determination refuse not feel like participate match
 ‘He made a firm decision to refuse to participate/?not to feel like participating in the match.’

This illustrates that the ‘exertion’ feature is incompatible with the force dynamics of *lǎndé* but should be compatible (optional) for *jùjué*. Based on the above observation, I propose the force dynamics of *lǎndé* as Figure 5.

Figure 5: The force dynamics of *lǎndé* (‘not feel like doing; not bother’)



Since the context that license *sīhuó* requires the feature of ‘strong confrontation’ between two forces, *lǎndé* is not compatible with *sīhuó* as it does not match this semantic requirement.

2.3.2.3.3 Fàngqì ‘give up’ versus jiānchí ‘persist’

Now let us turn to the third puzzle: why the verb of implicit negation *fàngqì* (‘give up’) cannot license *sīhuó* but the affirmative counterpart *jiānchí* (‘persist’) can. The first example below is repeated from section 1 and the rest two examples are extracted from online articles:

- (11) 他死活 {??放棄/堅持} 參加比賽。
 Tā sīhuó {??fàngqì / jiānchí} cānjiā bǐsài.
 3SG dead-live give up persist participate match
 (‘He gave up/persisted participating in the match no matter what.’)
- (12) 談正確的戀愛，找對正確的人，遠比你**死活堅持**下去重要的多。(“搜狐網文章” 2022-05-06²)
 Tán zhèngquè de liànnài, zhǎo duì zhèngquè de rén, yuǎn bǐ nǐ
 Talk right DE love find right right DE person far compare 2SG
sīhuó jiānchí xiàqù zhòngyào de duō.
 desperately persist down important DE much
 ‘Starting the right relationship and finding the right person is much more important than persisting desperately (in the relationship).’
- (13) 吳老師**死活堅持**該佚詩為曹雪芹真作……(今日頭條文章 2022-03-20³)
 Wú lǎoshī **sīhuó jiānchí** gāi yìshī wéi Cáoxuěqín zhēnzhuò…

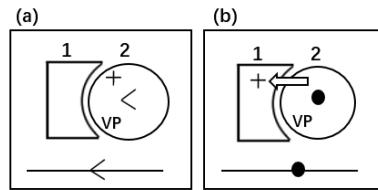
² The original text: https://www.sohu.com/a/544185766_120631996.

³ The original text: <https://www.toutiao.com/article/7077187025509712425/>.

Wu teacher no matter how insist that anonymous poem is Cao Xueqin real work
 ‘Mr. Wu insisted desperately that the anonymous poem is a real work by Cao Xueqin.’

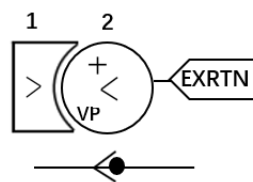
Similar to *jùjué* (‘refuse’), the force dynamics of *fàngqì* (‘give up’) in Figure 6 contains both a presupposition stage (that the subject attempted to or was assumed to do something) and an entailment stage (that the subject stopped doing the thing). Unlike *jùjué* (‘refuse’), however, the force dynamics of *fàngqì* (‘give up’) can be understood as that the subject intentionally withdraws the force of moving forward when he encounters the barrier and as a result, the resultant state is towards rest, which means the action/event intended by the subject does not happen at the end. In this case, there is no strong confrontation between two forces involved because the subject has already withdrawn his force.

Figure 6: The force dynamics of *fàngqì* (‘give up’)



Although compared to *fàngqì* (‘give up’), *jiānchí* (‘persist’) seems to be a ‘positive verb’ in terms of the evaluative meaning, it is *jiānchí* instead of *fàngqì* that can license the weak NPI *sīhuó*. This can be explained by the force dynamics of the verb *jiānchí* (Figure 7). In the case of ‘give up (doing something)’, the subject withdraws the force of the intention of doing a certain thing; thus there is no strong confrontation between the subject and another force. In the case of *jiānchí* (‘persist in doing something’), however, the subject moves forward against a barrier. In this case, a strong confrontation between the subject’s intention and that other force arises (see below). This matches the semantic feature ‘strong confrontation’ of the force dynamics of *sīhuó*, which explains the compatibility between the two.⁴

Figure 7: The force dynamics of *jiānchí* (‘persist’)



In fact, verbs like *persist/insist* are said to contain an implicitly negative meaning in their conceptual structures. Based on their corpus-based study, Pustejovsky et al. (1993:349-350) argue that predicates like *insist* show sensitivity to ‘discourse polarity’. They found that *insist* usually co-occurs with discourse markers that denote negative affect, such as *although* and *but*, as well as explicit negatives such as *no* and *not*.

In this section, I showed that the (in)compatibility between *sīhuó* and predicates can be explained by the force-dynamic model. The semantic property for a predicate to license the weak NPI adverb *sīhuó* is not entailing a negative proposition or being downward-entailing in the complement. Instead, *sīhuó*

⁴Conceptually speaking, if it is the case that somebody ‘gives up doing something’ repeatedly and desperately, one may say that this person is actually **persisting** in ‘giving-up’. This further supports the matching between the conceptual structure of NPI *sīhuó* and that of ‘persist’ rather than that of ‘give up’.

encodes an abstract conceptual schema which involves a confrontation between two forces. Predicates that encode such a force-confrontation may license *sīhuó*, no matter whether the complement of the predicate is a downward-entailing environment or not.

2.3.3 Conceptual force-confrontation provided by the context

On some occasions, the force confrontation between two subjects/entities is not indicated by negative words or verbs of implicit negation but by the context. The following example of *sīhuó* is given in Zhao (2014:24), which is drawn from CCL:

- (14) 到了 1980 年，我和兩名業務員去長春一家企業，進了 3 次門都叫趕出來，仨人一合計，他們是用管大戶，咱死活打進去。(CCL\1994 年報刊精選\12)

Dào le 1980 nián, wǒ hé liǎng míng yèwùyuán qù Chángchūn yì-jia qǐyè,
 Reach Perf 1980 year 1SG with two CL salesman go Changchun one-CL company
 jìn le sān-cì mén dōu jiào gǎn chūlái, sā rén yì héji,
 enter Perf three-CL door all PASS kick out three people one plan
 tāmen shì yòngguǎn dàhù, zán sǐhuó dǎ jìnqù.
 2PL be use pipe big client 2PL no matter how hit enter

‘When it came to 1980, I went with two salesmen to a company in Changchun. We were kicked out from the building three times. We three agreed that since they were a big client, we would get into the company (and work with them) no matter what [it took].’

In this example, *sīhuó* modifies the verb phrase *dǎjìnqù* (‘fight one’s way in’), which is clearly an affirmative expression without implicit negation. Also, the verb phrase ‘fight one’s way in’ does not belong to the verbs of body action like *lā* (‘pull’) or *zhuā* (‘grasp’). Zhao (2014) suggests that the affirmative expression *dǎjìnqù* (‘fight one’s way in’) can be analyzed as the opposite of the situation *jiào gǎnchūlái* (‘to be kicked out’), and thus can be regarded as a kind of negation. I agree with the author’s intuition about a sense of opposition implied in the context, but it was not made clear in Zhao (2014) that how this can be treated as a kind of negation and how it is related to the felicity of *sīhuó*. According to the force-dynamic analysis adapted here, the context of the above example involves a confrontation between two forces. The previous sentence denotes that the subject and his companions entered the company and got kicked out three times, but they still wanted to get into the company. This can be regarded as a back-and-forth process of the confrontation between the two forces. Such a semantic structure provided by the context matches the force-dynamic schema of *sīhuó* thus license the latter.

2.3.4 Historical development

Another merit of this force-dynamic analysis is that it reveals the conceptual similarity between the physical force interaction and the psychological or social ones. Historically, when *sīhuó* developed the use of an adverb, it often modified verbs of body actions such as *chán* (‘tangle’) and *tuō* (‘drag’) at the early stage of grammaticalization. This suggests that the physical status of confrontation of two forces may be the prototypical meaning of *sīhuó* and is the starting point of the development of other uses of the adverb. Let us look at some examples; the first two examples are cited from Wang T. (2007):

- (15) 如此沒用的老東西，也來厭世，死活纏人做甚麼？(《初刻拍案驚奇·卷二六》)

Rúcǐ méiyòng de lǎodōngxi, yě lái yànshì, sǐhuó
 Such useless DE old thing also come make fool desperately

chán rén zuòshénme?

tangle people why

‘Such a useless old man—he came to make a fool of himself. Why did he tangle with me desperately?’

(16) 西門慶告他說：“韓夥計費心，買禮來謝我，我再三不受他，他只顧**死活央告**，只留了他鵝酒。(CCL\金瓶梅·崇禎本)

Xīménqìng yānggào tā shuō: “Hán huǒjì fèixīn, mǎi lǐ lái
Ximen Qing beg 3SG say Han fellow concern buy present come
xiè wǒ, wǒ zàisān bú shòu tā, tā zhǐ **sǐhuó yānggào**,
thank 1SG 1SG repeatedly not accept 3SG 3SG only desperately beg
zhǐ liú le tā é jiǔ.
Only keep Perf 3SG goose wine

‘Ximen Qing told him: “Han was very thoughtful and bought me presents to thank me. I refused his gifts again and again, but he just kept begging me desperately. I just kept the goose and the wine.’”

(17) 襲人又**死活拉**了香菱來。(CCL\紅樓夢(中))

Xírén yòu **sǐhuó** **lā** le Xiānglíng lái.
Xiren then no matter how pull Perf Xiangling come

‘Xiren then dragged Xiangling [and begged her to come] desperately.’

The verbs *chán* (‘tangle’), *lā* (‘pull’), and *yānggào* (‘beg’) in the above examples do not denote pure body actions. They are all related to the meaning that the agent asks somebody to do something that this person is reluctant to do. It usually involves a back-and-forth process in which the agent asks or begs, while the person being asked rejects the request repeatedly. Such a dynamic process might serve as the bridging context where the physical confrontation extends to the mental confrontation between two agents.

3. A force-dynamic analysis to the distribution of *duànrán* (‘flatly’) and *xīnrán* (‘happily’)

The force-dynamic approach proposed in this article is not an ad-hoc analysis of *sǐhuó*; it may be also applied to the licensing contexts of other polarity-sensitive adverbs. I will briefly illustrate this point by the pair of adverbs *duànrán* (‘flatly’) and *xīnrán* (‘happily’).

The adverb *duànrán* means ‘flatly; categorically’; it denotes the manner of being determined when conducting an action (such as making a decision). Zheng (2017) excluded *duànrán* from the list of NPIs because *duànrán* appears in affirmative sentences most of the time in his sample drawn from the CCL corpus. In a total of 180 sentences with *duànrán*, 156 examples (86.7%) are affirmative structures while 24 examples (13.3%) are negative structures (Zheng 2017:32). In Zheng’s survey, the negative structures only include canonical negative sentences with negative words. Other negative contexts, such as interrogative sentences that carry negative forces or sentences with adversative predicates, are treated the same as simple affirmative sentences. However, this may conceal the negative polarity feature of *duànrán* compared with other adverbs which prefer a positive context, such as *xīnrán* (‘happily’). Therefore, I compared the distribution of *duànrán* and *xīnrán* in different polar environments using a sample extracted from CCL. The result is presented as follows:

Table 2: The polar environments of *duànrán* and *xīnrán*⁵

	Simple affirmatives	Implicit negation	Negative sentences	Total
<i>duànrán</i>	88 (34.2%)	142 (55.3%)	27 (10.5%)	257 (100%)
<i>xīnrán</i>	266 (98.5%)	0	4 (1.5%)	270 (100%)

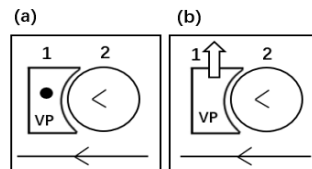
The class of ‘negative sentences’ refers to sentences with negative words. ‘Implicit negation’ refers to affirmative sentences with verbs of implicit negation as the main predicates, such as *jùjué* (‘refuse’), *fǒurèn* (‘deny’) and *fǒudìng* (‘negate’). ‘Simple affirmatives’ refers to affirmative sentences without implicit negation. Note that although the identification of verbs of implicit negation here mainly relies on the lexical meaning of the verbs, the result that *duànrán* often co-occurs with verbs of implicit negation while *xīnrán* barely does at all confirms the polar distinction between the two adverbs. The verbs that are modified most frequently by *duànrán* and *xīnrán* are listed as follows:

Table 3: Verbs modified most frequently by *duànrán*/*xīnrán*

	<i>duànrán</i>		<i>xīnrán</i>	
<i>jùjué</i> (‘refuse’)	106	<i>jiēshòu</i> (‘accept’)	42	
<i>juédìng</i> (‘decide’)	22	<i>tíci</i> (‘write’)	27	
<i>fǒurèn</i> (‘deny’)	16	<i>mìngbǐ</i> (‘write’)	25	
<i>fǒudìng</i> (‘negate’)	4	<i>tóngyì</i> (‘agree’)	24	
<i>tíngzhǐ</i> (‘stop’)	4	<i>yìngyǔn</i> (‘promise’)	17	
<i>huídá</i> (‘answer’)	3	<i>dāyìng</i> (‘promise’)	10	
<i>fāngqì</i> (‘give up’)	3	<i>zàntóng</i> (‘agree’)	8	

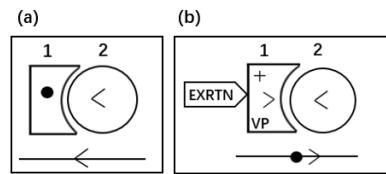
From the force dynamic perspective, the fundamental asymmetry between the semi-NPI adverb *duànrán* and the PPI adverb *xīnrán* is that the former is used in a context where the action of the subject is against the assumed direction of the development of the event while the case of *xīnrán* is in accordance with that direction. I propose the force dynamics schema of the PPI *xīnrán* (‘happily’) and semi-NPI *duànrán* as follows:

Figure 8: The force dynamics of the contexts that license *xīnrán* (‘happily’)



⁵ In CCL (modern Chinese), there are 1,936 results of *duànrán* and 2,258 results of *xīnrán* in total. I examined all the examples on pages 1, 3, 5, 7, 9 and 11 (300 results for each adverb). Some examples were excluded because *duànrán* is used as an adjective or the use of the adverbs in those examples is different from the meaning we discuss here.

Figure 9: The force dynamics of the contexts that license *duànrán* ('flatly')



The first phase (a) of the force dynamics is identical for both *xīnrán* and *duànrán*. It indicates that a request of some sort is put in front of the subject, awaiting a reaction from the subject. We perceive an request from the others as a force moving against the receiver (since the requester is expecting the requestee to act according to the will of the requester). Therefore, the intrinsic force tendency of phase (a) is acting towards the subject (the requestee). In the second phase, the subject in the context of *xīnrán* removes the potential barrier and thus allows the event denoted by VP takes place. This also correlates with the fact that *xīnrán* is most frequently used in contexts where the subject accepts an invitation from others (see Table 2). In the situation of *duànrán*, on the contrary, the subject actively turns against this request, usually with great mental resolution (as implied by the morpheme *duàn*, which can mean ‘determined’ as *juéduàn*), reflected by the [+exertion] feature. Also, the subject is the side with the greater force so the direction of the two forces changes to the opposite. This captures the fact that the context where *duànrán* usually indicates that the event develops toward a different (opposite) direction rather than the one expected. This explains why the verbs most frequently modified by *duànrán* are usually verbs of implicit negation, which generally carries the feature of blocking a force in their force dynamics.

4. Summary

This article might be the first attempt to apply the force-dynamic model to the issue of the licensing conditions for adverbial NPIs in Mandarin. The distribution of NPI adverbs like *sīhuó* (‘no matter what’) and *duànrán* (‘flatly’) demonstrates that a strictly defined logical property based on monotonicity (such as ‘downward entailment’) or some sort of hypothesized, covert negative operator (such as ‘Op’ or ‘NOT’) is not sufficient to explain the distribution of all adverbial NPIs in Mandarin. As Hoeksema (2008:29) points out, “For a proper account [for the NPI-licensing condition], we will need a better understanding of each class of items, and we will need to see which set of semantic features they are sensitive to, so as to be able to predict, from these features, the set of contexts that make up their distribution.” The ‘semantic features’ that an NPI is sensitive to may include a particular force-dynamic pattern carried by the lexical meaning of a predicate or by a context. This article shows that the licensing contexts of some adverbial NPIs in Mandarin can be properly described and explained from the perspective of force dynamics.

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