Two Types of *So*-Inversion: So similar but quite different

July 28, 2010

Abstract

The English *so*-inversion construction places the expression *so* in the pre-auxiliary position followed by the subject. In the traditional analysis, the auxiliary preceding the subject has been taken to undergo the I-to-C movement. However, complication arises with the possibility of having a cluster of auxiliary verbs in the C position or leaving a VP (or remnants) after the subject. In this paper, we claim that there are in fact two different types of *so*-inversion, which behave alike in many respects but are quite different. We show that these two types, called as SAI *so*-inversion and Focus *so*-inversion, respectively, are licensed due to the possible mapping relations between form and function.

Key Words: *so*-inversion, VP ellipsis, VP fronting, subject extraposition, construction

1   Basic Properties

One intriguing use of the expression *so* concerns the so-called *so*-inversion, as exemplified in (1):[1]

---

[1] The expression *so* has a variety way of uses:

(i) a. There was a bus strike on, [so] we had to go by taxi.

    b. This may make the task seem easier and [so] increase self-confidence.

    c. A: Are you putting the price up? B: I am afraid [so].

    d. A: Jill has misspelt our name. B: [So] she has!

    e. They were very happy at that time, or at least they seemed [so].

    f. The ark module is [so] named in keeping with their interests.

    g. We usually cut up her spaghetti [so] that she can eat it with a spoon.

    h. As infections increased in women, [so] did infections in their babies.

In (a), it functions as coordinator whereas in (b) it is just an adverbial element. In the examples in (c) – (e), *so* is used as an anaphoric element whose antecedent is a S, VP,

(1) a. Jill will certainly notice the mistake, and so will Max.

    b. Mary can pass the exam, and so can Tom.

As observed in the literature, this kind of *so*-inversion carries several grammatical constraints. For example, *so* here has additive meaning 'also' (Culicover and Winkler 2008):

(2) a. *I was there, and so Sandy was.

    b. *Leslie eats pizzas, and so Sandy does.

When *so* means 'therefore', no inversion is required (from Culicover and Winkler 2008):

(3) a. I was there, and so SANDY was, too.

    b. I was there, and so I was not HERE.

In these examples, *so* denotes a consequence of the event denoted by the preceding sentence and it is natural to place a highlight either on the subject as in (3a) or another contrastive element as in (3b).

In addition, *so*-inversion requires an affirmative antecedent, unlike other additive constructions (Klima 1964, Wood 2008):

(4) a. John does not play the guitar and *so do I not (play guitar).

    b. John does not play the guitar and neither do I (play guitar).

One main difference between *neither* and *so* is thus the polarity value of the preceding sentence.

This polarity value is also applied within the construction itself. That is, the *so*-inversion construction itself must also be affirmative, unlike *neither*-inversion:[2]

(5) a. *Jill won't notice the mistake, and so won't Max.

    b. Jill won't notice the mistake, and neither will Max.

As a pragmatic constraint, the subject of the clause introduced by *so* must contrast with that of the preceding sentence. This constraint explains the oddness of examples like the following:

---

and AP, respectively. In (f), it is used as a manner, whereas in (g) it introduces a result clause. (h) is peculiar in that *so* is linked to the conjunct *as*, which also induces inversion.

    [2]Conversely, *neither*-inversion requires a negative antecedent.

  (i) a. John doesn't play the guitar and neither do I.

      b. John plays the guitar and *neither do I (play guitar).

(6) a. *He can play the piano, and so can he sing.

    b. *She has invited Max, and so does she intend to invite Paul.

This hints that the subject in the *so*-inversion needs to have contrastive focus information, whose property we will discuss in more detail.

    One complication that the *so*-inversion construction brings out is that not only a single but also a cluster of auxiliary verbs can occur in the pre-subject position. Consider the following naturally occurring data:

(7) a. The solider wanted to protect his people, and so could we. (COCA)

    b. Jimmy Carter would have been reelected, and so [would have] [Dukakis]. (COCA)

In (7a), the single auxiliary precedes the subject, whereas in (7b), the auxiliary cluster *would have* appears in the pre-subject position.

    In this paper, we will show that in fact there are two different *so*-inversion constructions: examples like (7a) are canonical SAI (subject-auxiliary inversion) *so*-inversion whereas those like (7b) are Focus *so*-inversion in which the subject is extraposed to the sentence final position. Even though these two are similar and related, we show that they display quite different properties that cannot be relegate to general properties of a single *so*-inversion construction, as traditionally have been assumed.

2   VP Preposing and Pro-verb Analysis

The traditional analysis for the *so*-inversion construction, as set forth by Quirk et al. (1985: 882), is to resort to the I-to-C movement. Consider the following:

(8) a. You asked him to leave, and so did I.

    b. The corn is ripening, and so are the apples.

    c. You've spilled coffee on the table, and so have I.

The intuitive appeal for such examples is to assume that the auxiliary verbs *did, are*, and *have* are moved from I to C, followed by the VP preposing and pro-verbalization by *so*. The strong support for the I-to-C movement process here can also be observed from attested corpus examples like the following:[3]

(9) a. If the firstfruits are good, so will [the main crop] be. (BNC)

---

[3]Most of the corpus examples are extracted either from BNC (British National Corpus) or COCA (Corpus of Contemporary American English).

b. That's too near to the main road, so if that was too near to the main road, so will [this one] be. (BNC)

c. And if this room was real, so might [the others] have been. (BNC)

In these examples, there is one auxiliary in the pre-subject position, leaving the other auxiliary verbs behind. Since there is only one position in front of the subject, it would be natural to assume that the auxiliary here is moved to the C position.

However, as pointed out by Toda (2007) and Culicover and Winkler (2008), the simple I-to-C movement process is questioned by the existence of an auxiliary cluster:

(10) a. The results of education are long term and far reaching and so [must be] our commitment. (COCA)

b. East Germans could have behaved more bravely and more honorably, so [could have] the West Germans. (COCA)

Since there is only one C position for the auxiliary, multiple auxiliary verbs in the pre-subject position are not expected within the simple I-to-C movement approach. As noted by Newmeyer (1998: 48), in canonical SAI constructions, no auxiliary cluster is allowed in the C position:

(11) a. *Have been you waiting wrong?

b. *Never has been he greeted with a friendly word.

As a way of explaining the auxiliary cluster examples in *so*-inversion, Toda (2007) posits the subject-postposing process in the inversion. For example, in Toda's analsyis, the surface sentence (12a) will have the source structure (12b):

(12) a. John can speak French, [so can Mary].

b. Source structure: John can speak French, [$_{IP}$ Mary [$_{I'}$ can [$_{VP}$ speak French]]]

This source then undergoes at least the following four movement processes:

(13) a. VP-preposing:

[$_{CP}$[$_{VP}$ speak French]$_i$ [$_{IP}$ Mary [$_{I'}$ can t$_i$]]]

b. I-to-C movement:

[$_{CP}$[$_{VP}$ speak French]$_i$ [$_{C'}$[$_C$ can]$_j$ [$_{IP}$ Mary [$_{I'}$ t$_j$ [$_{VP}$ t$_i$]]]]]

c. Subject postposing:

$[_{CP}[_{VP}$ speak French$]_i$ $[_{C'}[_C$ can$]_j$ $[_{IP}[_{IP}$ t_k $[_{I'}$ t_j $[_{VP}$ $t_i]]]$ Mary$_k]]]$

d. Obligatory proverbalization:

[so] can Mary

A strong advantage of such an analysis may come from the variations in (14):

(14) a. Bill must be a genius and so must be Ann.

b. Bill must be a genius, and so must Ann be.

The auxiliary cluster example in (14a) is generated with the following processes:[4]

(15) a. VP preposing:

[A genius]$_i$ [Ann must be __ $_i$].

b. I-to-C movement:

[A genius]$_i$ [must$_j$ [Ann be __ $_j$ __ $_i$]].

c. Subject Postposing:

[A genius] [[must [__ $_k$ be __ __]] Ann$_k$].

d. Proverbalization:

[So [must be Ann]].

The subject postposing is thus a key to the generation of an auxiliary cluster in *so* inversion. Meanwhile, (14b) undergoes no subject postposing process as shown in the following:[5]

(16) a. VP preposing:

---

[4] The phrase *A genious* is an NP, but is a predicative phrase. The VP preposing encompasses this kind of preposing too.

[5] As noted by Stroik (2001), *do* in the do-so construction is a main verb, while *do* in the *so*-inversion is an auxiliary. One difference lies in the type of antecedent: the *do-so* proform cannot have a stative antecedent whereas the VP proform *so* in the *so*-inversion can:

(i) a. *Mary likes Sam, and Chris does so too.

b. Mary likes Sam, and so does Chris.

[A genius]$_i$ [Ann must be __ $_i$].

b. I-to-C movement:

[A genius]$_i$ [must$_j$ [Ann be __ $_j$ __ $_i$]].

c. Subject Postposing: No application

d. Proverbalization:

[So [must be Ann]].

In such examples, the subject stays in situ, and only the VP is preposed and undergoes proverbalization.

Appealing as this kind of analysis seems to be, it raises several empirical and theoretical issues. The first question concerns what triggers the I-to-C movement. Within the analysis of Quirk et al. (1985) and Toda (2007), it is the VP-preposing that triggers I-to-C movement. However, note that VP-preposing has no correlation with I-to-C movement, as also pointed out by Hatakeyama et al. 2010:

(17) a. John wanted to win the race, and [win the race] he did.

b. *John wanted to win the race, and [win the race] did he.

In addition, unlike VP-preposing, *so*-inversion has no property of long distance dependency or unbounded dependency:

(18) a. If Leslie says Robin believes Terry thinks Kim will go to the movies, then [go to the movies] [Robin indeed believes [Terry thinks [Kim will __]]].

b. Robin believes Terry thinks Leslie will go to the movies, and [she believes [Terry thinks (that) [so will Kim]]].

c. *[So [Robin indeed believes [Terry thinks [will Kim __]]]].

The expression *so* here cannot be linked to the element in an embedded clause.

The VP preposing analysis with the subject postposing meets further complication with examples with the remaining VP material. Observe the following corpus examples:

(19) a. The Druze will continue as individuals to play their policing role, but so will they [continue as a group to protest it indirectly through democratic channels]. (COCA)

b. Just as some children ignore their parents, so do some parents [ignore their children]. (COCA)

In these examples, the relevant VP still exist, indicating that there is no VP preposing process or they are different from the *so*-inversion. If such examples are *so* inversion, then something else will trigger the I-to-C movement.

Toda (2007) suggests that the VP-preposing analysis accompanied by I-to-C movement can naturally rule out examples like the following:

(20) a. *John began speaking French and so began Ann.

    b. *Sally wanted to visit Prague and so wanted to (do Bill).

These are unlicensed simply because *began* and *want* are not qualified as I-elements. However, consider the following naturally occurring data:[6]

(21) a. Phon is dead and so [goes] my net access in the hub. (COCA)

    b. The news shocked the Zhang family and so [began] a month-long ordeal. (COCA)

The subject is in the sentence final position, but there is no auxiliary. Such examples indicate that the *so*-inversion construction involves more than the simple I-to-C movement process and further that subject postposing may not be the key answer to the variations of the *so*-inversion construction.

3 VP Ellipsis and Adverbial Analysis

Instead of assuming that VP preposing triggers I-to-C movement in *so*-inversion, one may attribute the inversion to the properties of degree expressions *so*. There are environments where degree adverbs like *so* or *thus* can trigger the SAI (cf. Green 1985):

(22) a. So well did he play that Palace signed him from Leicester. (BNC)

    b. So greatly did they enjoy the celebrations that they stayed for three days. (BNC)

    c. Thus did he make fools of his people and demeaned them. (BNC)

    d. Thus did he speak and the heart of Diomed was glad. (BNC)

Including negative adverbs like *never*, degree adverbs thus can induce the subject-auxiliary inversion.[7]

As hinted by Goldberg and Giudice (2005) and suggested by Hatakeyama et al. (2010), *so*-inversion seems to be related to VP ellipsis. One supporting piece of evidence concerns the possibility of having sloppy readings (cf.

---

[6]See Culicover and Winkler (2008) name examples like (21a) as *so-go* construction.

[7]Within this assumption, the expression *neither* can be treated just like *so* in triggering the SAI.

Williams 1977, Hatakeyama et al. 2010). Consider the following *so*-inversion and VP ellipsis examples:

(23) a.　I know he loves his mother, and so does she.

　　 b.　I know he loves his mother, and she does, too.

In both cases, the following sloppy and strict-identity readings are available, supporting the idea that the two constructions are involved in the same phenomenon:

(24) a.　She loves his mother.

　　 b.　She loves her mother.

　　This VP ellipsis approach can also predict examples where the VP still remains after the subject.

(25) A:　Tom is very nervous.

　　 B:　So would you be in his position. (Huddleston and Pullum 2002: 1539)

Such an example is possible since the optional VP ellipsis is not applied. The subject occupies the Spec of IP and *would* moves from I to C, triggered by the adverb *so*. As noted earlier, we can find more attested examples where the VP in question does not undergo ellipsis:

(26) a.　As we become more proficient in meditating about the "I and Thou", so will we find more beauty. (BNC)

　　 b.　Those days are long gone. And so may be the days of every 49ers home game [being on local television]. (COCA).

　　 c.　This forecast is admittedly way above the estimate of most analysts in several recent surveys. But so is reality [generally far off from the consensus.] (Huddleston and Pullum 2002: 1539)

As noted, the VP ellipsis can even be applied after the post-subject remnant auxiliary:

(27) a.　If one set is deemed socially (un) desirable, so should the other set be. (BNC)

　　 b.　And if this room was real, so might the others have been. (BNC)

Given that VP ellipsis is an optional process (cf. Williams 1977), such examples are expected.[8]

---

[8]The VP ellipsis analysis would not generate examples like the following:

However, VP ellipsis alone cannot explain the auxiliary cluster in *so*-inversion which we often attest in naturally occurring data. The solution that Hatakeyama et al. (2010) introduces is the so-called 'amalgam' head movement process as illustrated in the following:

(28) a. VP ellipsis

$[_{CP}$ so $[_C [_{IP}$ Ann $[_I$ must be $[VP$ φ $]]]]]$

b. Amalgam I-to-C movement head movement

$[_{CP}$ so $[_C$ must-be $[_{IP}$ Ann $[_I$ t$_i$ $[_{VP}$ φ $]]]]]$

The source sentence first undergoes the VP ellipsis process and then the two auxiliary verbs are amalgamed together, and moved to the C position.

One immediate question that arises from such an analysis is the validity of amalgam process. What triggers this process? The auxiliary cluster can also be found in other inversion constructions such as predicate inversion, locative inversion, comparative inversion, etc (cf. Culicover and Winkler 2008):

(29) a. Less interesting has been the fact that the verb is uninflected.

b. Into the building could have entered the angry mob.

c. Tom ran much faster than could have Mary.

However, as noted earlier , the canonical SAI has the restriction of only one auxiliary element to inverted C position (Newmeyer 1998, Borseley and Newmeyer 2009):

(30) a. *Have been you working late?

b. *What have been you eating?

c. *Under no circumstances, will be I talking a leave of absence.

d. *Had been I thinking about the dangers, I never would have done that.

e. *So competent has been Mary, she will surely get the promotion.

(i) *So would be in his position you.

Within the subject postposing analysis such as that of Toda (2007), an additional mechanism is required to block the subject *you* from being moved to the final position. However, the VP ellipsis analysis with the subject being in situ has no way to generate this kind of example.

We then need to differentiate these two different types of inversion.

In addition, this amalgam is not always possible, in particular, when the VP (or remnant) remains:

(31) a. So would you be in his position.

   b. *So would be you in his position.

This contrast implies that the auxiliary clustered *so*-inversion is different from the canonical SAI *so*-inversion.

One thing to note at this point is that neither VP fronting nor VP ellipsis can expect the *so*-inversion with verbs like *go, begin, say*, etc:

(32) a. As Marian Gaborik goes, so goes the Wild offense. (COCA NEWS Denver)

   b. And so began the greatest revolution in the history of science. (COCA MAG Smithsonian)

   c. I assume we could agree at least that medication should not be a crime. So says a state law. (COCA NEWS SanFrancisco)

In these corpus examples, even though the subject is inverted with *so* in the sentence initial position, there is neither conceivable I-to-C movement nor VP ellipsis we can think of.

In addition, this kind of VP ellipsis and movement analysis has also no clear way of stating the restriction on the polarity value. That is, the *so*-inversion clause as well as its antecedent needs to be affirmative. This kind of constructional property, in addition to those we have just seen, seems to be irreducible characteristics of the *so*-inversion construction.

4   Two Different Types: A Construction-based perspective

What we have seen so far indicates that there are two different types of *so*-inversion: SAI *so*-inversion and Focus *so*-inversion. These are similar and related, but behave differently in several respects. Observe the following attested examples:

(33) a. If you are tall and lean, so should your drawn image be. (BNC)

   b. If the roles had been reversed, so might have been the treatment of reporters. (Time)

Examples like (33a) are apparent SAI *so*-inversion where the auxiliary *should* is inverted with the auxiliary *be* remaining in the post subject position. Meanwhile, those like (33b) are Focus *so*-inversion where the heavy subject is 'focused'. The difference between these two is also noted by Culicover and Winkler (2008):

(34) a. Leslie had been there, and $\left\{\begin{array}{l}\text{so had I.}\\ \text{*had been I}\end{array}\right\}$

    b. Leslie had been there, and so $\left\{\begin{array}{l}\text{had Sandy.}\\ \text{had been Sandy}\end{array}\right\}$

As shown from the contrast here, the *so*-inversion can have a pronominal subject, but the auxiliary cluster prefers a 'heavy' pronominal. Our web search also supports the idea that the auxiliary clustered *so*-inversion has a heavy NP subject. Of the 45 corpus examples with the cluster auxiliary verbs, all the subjects are identified to be heavy:

(35) a. If the entity model is inaccurate so will be [the database and the applications that use it]. (COCA)

    b. The moral pressure on strong-minded people is in fact intense, and so must be [the psychic pressure]. (COCA)

    c. This would be natural enough, for nuclei are positive, and so would have [a strong attraction for negative mesons]. (BNC)

    d. If the roles had been reversed, so might have been [the treatment of reporters]. (COCA)

When a proper noun functions as the subject, it bears contrastive focus or at least serves as 'discourse-new as' illustrated in the following corpus examples:[9]

(36) a. Then C-1 is in general fully populated, and so would be [C-1B]. (BNC)

    b. When told of Alomar's comments the next day, Hirschbeck had to be restrained from going after him and was forced to sit out the game. So should have Alomar. (BNC)

In these examples the subjects *C-1B* and *Alomar* are not new information but function as contrastive focus and discourse new.

From our corpus search (BNC and COCA), we have not been successful in finding the pronoun subject preceded by a cluster of auxiliary verbs.

---

[9]See Birner and Ward (1998) for the notion of discourse-old and discourse-new.

Instead, what we observed is the single finite auxiliary in the pre-subject position:

(37) a. When they understood his amazing proposition they scurried to sign. So would [you] have done.

b. For a friar I am very quick, My Lord Coroner, and so would [you] be if you drank less claret!

c. Their world was what it was, hot, harsh, mostly parched and bare, scoured by rains that turned the rivers to mudflows and uncovered bedrock to the sky. So had [it] been and always would be.

Of course, a heavy NP or an NP with contrastive focus can also appear in the SAI *so*-inversion:

(38) a. If the firstfruits are good, so will [the main crop] be.

b. That's too near to the main road, so if that was too near to the main road, so will [this one] be.

The attested data thus give us the following generalization:

(39) a. In the Focus *so*-inversion construction, the subject is heavy or contrastive.

b. In the SAI-*so*-inversion construction, the subject needs to be contrastive.

Given that there are two different structural realizations of *so*-inversion linked with different functions, we assume that the SAI *so*-inversion is just a regular subtype of the SAI construction (*sai-cx*) in English (cf. Fillmore 1999).

(40)

sai-cx

yes-no-q   counterfactual-inv   neg-inv   neither-inv   sai-so-inv
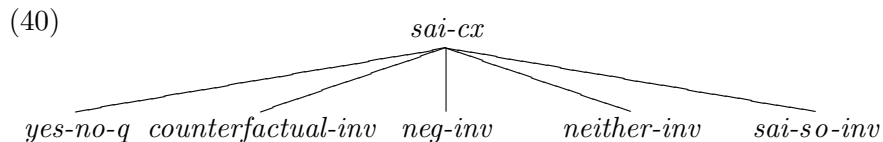
All these subconstructions have the formal properties that there is only one auxiliary in the pre-subject position, C:

(41) a. Has she been to America?/*Has been to America?

b. Had she been accepted, they would be here by now./*Had been she accepted, they would be here by now.

   c.   Seldom had she been rejected./*Seldom had been she rejected.

   d.   Neither could they have tried./*Neither could have they tried.

However, the Focus *so*-inversion construction is not a subtype of this SAI construction: we claim that it is syntactically a subtype of extraposition in which the heavy NP is located at the sentence final position, as represented in the following hierarchy:

(42)
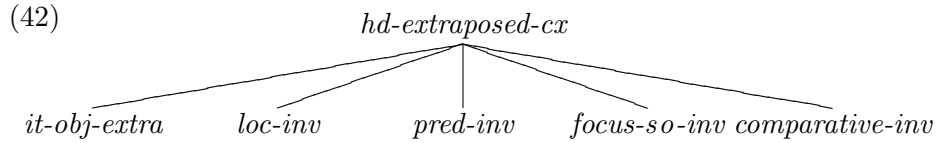
The hierarchy implies that the Focus *so*-inversion construction parallels with the heavy locative inversion in which the post-verbal subject needs to be heavy or contrastive (cf. Culicover and Levine 2001):

(43) a.   Into the room hopped an extremely angry Kangaroo.

      b.   Sitting on the bench was several half-empty boxes of chocolate.

Note that these constructions all place the heavy (or contrastive focus) elements at the end of the sentence with an auxiliary cluster in the pre-subject position:

(44) a.   Into the room hopped *he/HE.

      b.   Sitting on the bench was *she/SHE.

(45) a.   Into the room was hopping an extremely angry Kangaroo.

      b.   Sitting on the bench had been several half-empty boxes of chocolate.
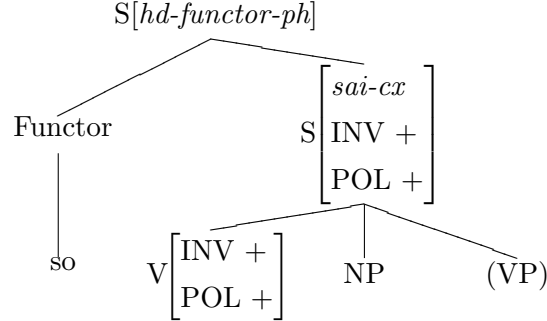
We thus assume that all these focused inversion constructions including *it*-extraposition and locative inversion are those (head-extraposition) where the subject is extraposed to the sentence final position.[10]

    The present analysis thus assumes that *so*-inversion can have two different syntactic realizations: one has an SAI the other as an extraposed structure:[11]
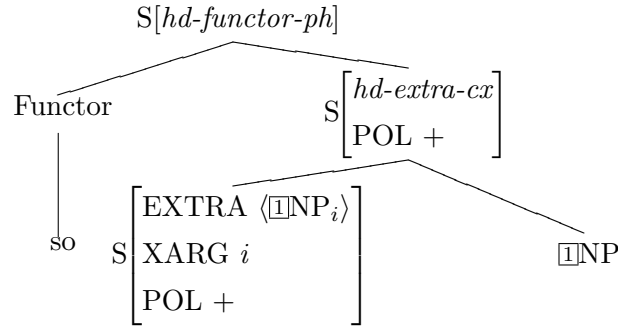
---

[10]As for the discussion of *it*-extraposition, see Kim and Sag (2005).

[11]Following Van Eynde (2007) and Kim and Sells (2009), we assume that specifiers and modifiers are functors. English thus employs the head-functor phrase consisting of a functor and a head that the functor selects as its semantic argument.

(46) a.   SAI *so*-inversion construction:

S[*hd-functor-ph*]

Functor — S $\begin{bmatrix} sai\text{-}cx \\ \text{INV} + \\ \text{POL} + \end{bmatrix}$

so

V $\begin{bmatrix} \text{INV} + \\ \text{POL} + \end{bmatrix}$ NP   (VP)

b.   Focus *so*-inversion construction:

S[*hd-functor-ph*]

Functor — S $\begin{bmatrix} hd\text{-}extra\text{-}cx \\ \text{POL} + \end{bmatrix}$

so

S $\begin{bmatrix} \text{EXTRA } \langle \boxed{1}\text{NP}_i \rangle \\ \text{XARG } i \\ \text{POL} + \end{bmatrix}$ $\boxed{1}$NP

As represented in these two structures, *so* functions as a functor combining with an SAI construction (*sai-cx*) or an head-extraposition construction (*hd-extra-cx*), both of which are required in the English grammar.[12] In both constructions, the polarity value (POL) is positive, capturing the constructional constraint of *so*-inversion that the argument of *so* needs to be positive:

(47) a.   John sang a song, and so did I/*so didn't I.

b.   Tom had been there, and so had been Mary/*so hadn't been Mary.

Other than this, the two constructions are different. The SAI *so*-inversion requires the auxiliary be inverted whereas the Focus *so*-inversion requires the subject (XARG: external argument) to undergo extraposition.[13] The SAI *so*-inversion will also expect other similar examples. Consider the following:

---

[12] As noted by Culicover and Jackendoff (2005), there are many lexical expressions whose lexical category cannot be simply decided. Assuming *so* is one example. We have seen that *so* can be used as a variety of different lexical categories such as adverb and coordination marking. The category of *so* in *so*-inversion can vary depending on context. See Fillmore (1999), Kim and Sag (2005), and Kim and Sells (2009).

[13] The grammar independently requires the extraposed element to be heavy. The external argument (XARG) needs to be visible in many phenomena including tag questions. See Kim and Sells (2008).

(48) a. So well did he play that Palace signed him from Leicester. (BNC)

    b. So awful do I feel now that I now cannot sign off. (COCA FIC AntoichRev).

In these examples, AdvP *so well* and AP *so awful* both serve as the functor combining with an SAI sentence. Note that in such examples, the focus can be placed either in the functor phrase or at the sentence final expression. By treating *so* as a functor element combining with an SAI, we can expect that it can be combined with another element first. We observe that *so* can occur with expressions like *too*:

(49) a. Good theatre asks difficult questions; [so too] should our drama work. (BNC)

    b. The stage itself will be higher than last year, and [so too] will the lighting gantry (BNC)

    c. The statement would then be privileged and [so too] would any report of it. (BNC)

The presence of *too* here is expected if we assume that the functor *so* together with the intensifier *too* combines with the SAI.

    As noted, there is evidence that Focus *so*-inversion is different from SAI *so*-inversion. As noted in (34), the auxiliary cluster does not license a light subject, as we have seen earlier in this section. Similar constructions also exist. As noted by Culicover and Winkler (2008), *as* also allows the subject inversion with an auxiliary cluster:

(50)   Sandy would have been very angry, $\begin{cases} \text{as would Leslie/he.} \\ \text{as would have Leslie/*he.} \\ \text{as would have been Leslie/*he.} \end{cases}$

Just like Focus *so*-inversion, the subject here needs to be heavy or contrastive, implying that it is extraposed. Comparatives also behave in a similar way (cf. Goldberg and Guidice 2005, Culicover and Winkler 2008):

(51) a. *Our library has more article than has it.

    b. He has read more articles than have his classmates.

    c. Anna ran much faster than could have MANNY.

    d. *Anna ran much faster than COULD have Manny

Comparative inversion requires that its subject be heavy or contrastive whether it has a single or cluster auxiliary. This indicates that the inversion here places a stricter restriction on the subject.

Note once again that the subject of the SAI *so*-inversion need not be contrastive or focused (cf. Wood 2008):

(52) a.　Just as we keep our promise to the next generation here at home, so must we keep America's promise abroad. (COCA)

b.　The Druze will continue as individuals to play their policing role, but so will they continue as a group to protest it (COCA).

This again tells us the difference between the two.

In the present analysis where the subject in the Focus *so*inversion is in the sentence final position thru extraposition, we do not expect any element after the extraposed subject. This prediction is borne out:

(53) a.　A: Tom is very nervous. B: So would you be in his position.

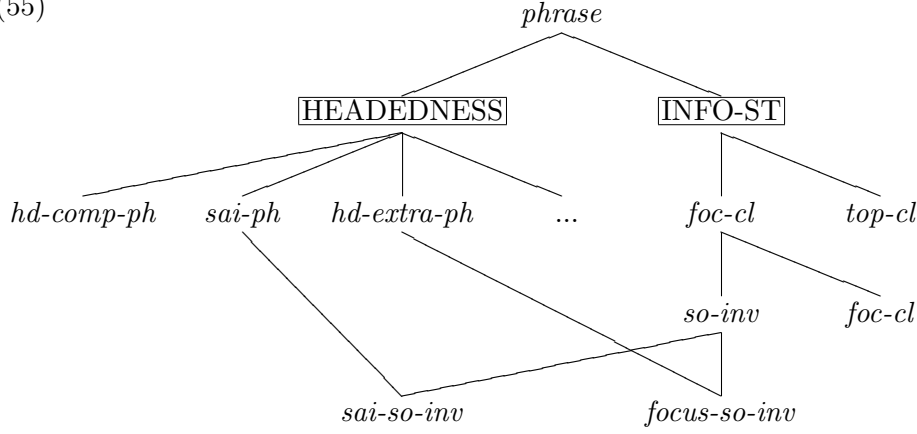b.　A: Tom is very nervous. B: *So would be you in his position.

With the simple auxiliary, there is nothing wrong to have the remnant as in (53a), but with the auxiliary cluster, no element can appear after the subject.

Our extraposition-based analysis can also expect the presence of non-auxiliary verbs in *so*-inversion. In addition to verbs like *go, begin*, those like *run, say, write, end* can also appear in the inversion, as seen from the following corpus examples.

(54) a.　"If a job is worth doing, it is worth doing well." So [runs] the adage. (COCA)

b.　"Pop? Your driving days are over." So [said] the mechanic in his oily dungarees. (COCA)

c.　"You won't ignore this car, nor will BMW and Mercedes." So [wrote] a journalist. (COCA)

d.　Helen, now middle aged, but still a beauty, was reunited with her husband Menelaus. So [ended] the Trojan war. (GOOGLE)

One remaining question that we have not discussed here yet is why we have two different types of *so*-inversion? Why does the language introduce the complication in the grammar? We suggest it is a natural consequence of interactions between syntactic properties (headedness) and information-structure, or between form and function, as sketched in the following constructional hierarchy:

(55)

$$phrase$$

```
                          phrase
                        /        \
                 HEADEDNESS      INFO-ST
              /    |    |    \      |    \
     hd-comp-ph  sai-ph  hd-extra-ph  ...  foc-cl  top-cl
                    \        \         /  |      \
                     \        \       /   so-inv  foc-cl
                      \        \     /   /  \
                       \        \   /   /    \
                        sai-so-inv   focus-so-inv
```

The constructional hierarchy here shows us that the grammar has at least two different dimensions: headedness of a phrase and information-structure. The headedness concerns the 'form' of an expression whereas the information-structure represents the 'function' of a given expression (cf. Sag 2010). When these two are linked together, the grammar induces a construction (see Fillmore 1999). We can observe that *sai-so-inv* is the mapping of the *sai* syntactic construction with the general focus construction whereas *focus-so-inv* is the linking of the head-extraposition with *so*-inversion. Each of these two also has its own idiosyncrasies specifying which element can carry sentential focus. This in turn means that the grammar may utilize all the possible linking between forms and functions. We thus conjecture the variations of *so*-inversion are closely linked to the interactions between form and function, as traditionally assumed as the main philosophy of Construction Grammar (cf. Fillmore 1999, Sag 2010).

5 Conclusion

We have shown that there are at least two types of the *so*-inversion constructions: one with the subject-aux inversion and the other with subject extraposition with a contrastive focus. Even though they share the property of being a head-functor phrase combining with a special argument phrase whose polarity value is positive, in addition to both being sensitive to VP ellipsis, they are quite different. For example, the SAI *so*-inversion involves the subject-auxiliary inversion whereas the Focus *so*-inversion does not. The latter has the subject extraposed to the sentence final position, while the subject of the former is in situ. Pragmatically, in both constructions, the subject needs to be heavy, but it is only the subject of the focus-*so*-inversion which must be obligatorily focus. These variations lead us to posit two different *so*-inversion constructions.

The variations come from the lexical as well as constructional variations. In particular, the variations are due to the linking between form and

function. That is, the linking between the form of SAI and the function of *so*-inversion is one case (SAI *so*-inversion), while the one between the form of extraposition with the function of focus is the other case (Focus *so*-inversion). We have assumed that the available mapping relations between form and function allow the grammar to generate these two kinds of *so*-inversion.

References

Birner, Betty J., and Gregory Ward. 1998. *Information status and non-canonical word order in English.* Amsterdam: John Benjamins.

Borsley, Robert and Frederick Newmeyer. 2009. On subject-auxiliary inversion and the notion "purely formal generalization". *Cognitive Linguistics*, 20.1: 135–143.

Culicover, Peter W. and Ray Jackendof. 2005. *Simpler Syntax.* Oxford: Oxford University Press.

Culicover, Peter, and Robert Levine. 2001. Stylistic Inversion in English: A Reconsideration. *Natural Language and Linguistic Theory* 19: 283-310.

Culicover, Peter, and Susanne Winkler. 2008. English focus inversion. *Journal of linguistics* 44: 625–658.

Fillmore, Charles. 1999. Inversion and constructional inheritance. In Webelhuth, Gert, Jean-Pierre Koenig, and Andras Kathol (eds.), *Lexical and Constructional Aspects of Linguistic Explanation*, 113-128. Stanford, CA: CSLI Publications.

Goldberg, Adele E. and Alex Del Giudice. 2005. Subject-auxiliary inversion: A natural category. *Linguistic Review* 22, 411–428.

Green, Georgia M.1985. The description of inversions in Generalized Phrase Structure Grammar. *Berkeley Linguistics Society* 11: 117–145.

Haddican, Bill. 2007. The Structural Deficiency of Verbal Pro-Forms. *Linguistic Inquiry* 38:539- 547.

Hankamer, Jorge, and Ivan Sag. 1976. Deep and surface anaphora. *Linguistic Inquiry* 7: 391-428.

Hatakeyama, Yuji, Kensuku Honda, and Kosuke Tanaka. 2010. The so-inversion construction revisited. *The Linguistic Review* 27.1: 25-36.

Huddleston, Rodney and Geoffrey Pullum. 2002. *The Cambridge grammar of the English language.* Cambridge: Cambridge University Press.

Johnson, Kyle.2001. What VP ellipsis can do, and what it can't but not why. In *The handbook of contemporary syntactic theory*, ed.by Mark Baltin and Chris Collins, 439.479. Oxford: Blackwell.

Kim, Jong-Bok, and Ivan A. Sag. 2005. English Object Extraposition: A Constraint-Based Approach. *Proceedings of the HPSG05 Conference,*

University of Lisbon, Stefan Mueller (Editor). CSLI Publications, Pp. 192–212.

Kim, Jong-Bok and Peter Sells. 2008. *English Syntax: An Introduction.* CSLI Publications.

Kim, Jong-Bok and Peter Sells. 2009. The Big Mess Constructions: Revisited. Paper Presented at the Workshop on NP structures. Univ. of Vigo, Spain.

Klima, Edward. 1964. Negation in English. In Jerry Fodor and Jerrold Katz (eds.), *The Structure of Language*, 246-323. Englewood Cliffs, NJ: Prentice-Hall.

Levine, Robert. 1989. On focus inversion: Syntactic valence and the role of a SUBCAT list. *Linguistics* 17: 1013-1055.

Newmeyer, Frederick J. 1998. *Language Form and Language Function.* Cambridge, MA: MIT Press.

Nathan, Lance. 1999. *Either: Negative Polarity Meets Focus Sensitivity.* Honors thesis, Brown University.

Quirk, Randolph, Sidney Greenbaum, Geoffrey Leech, and Jan Svartvik. 1985. *A comprehensive grammar of the English language.* London: Longman.

Sag, Ivan A. 2010. Sign-Based Construction Grammar: An informal synopsis. To appear in H. Boas and I. A. Sag (eds.) *Sign-Based Construction Grammar.* Stanford: CSLI Publications.

Stroik, Thomas. 2001. On the light verb hypothesis. *Linguistic Inquiry* 32: 362 –369.

Toda, Tatsuhiko. 2007. So-inversion revisited. *Linguistic Inquiry* 38:188-195.

Van Eynde, Frank. 2007. The Big Mess Construction. In Stefan Mʹuller (ed.), *The Proceedings of the 14th International Conference on Head-Driven Phrase Structure Grammar*, 415-433, Stanford: CSLI Publications.

Williams, Edwin. 1977. Discourse and logical form. *Linguistic Inquiry* 8: 101-139.

Wood, Jim. 2008. So-inversion as Polarity Focus. In *Proceedings of the 38th Western Conference on Linguistics* 19: 304-317