# 'Between' constructions in Biblical Hebrew 

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Unlike its English counterpart between, the Biblical Hebrew (BH) preposition bên does not allow a conjoined object (between $A$ and $B$ ), but it uses additional prepositions in two typologically unusual patterns: bên $A w^{\partial}$-bên $B$ 'between A and-between B' and bên A la-B 'between A to-B'. This article shows that these two patterns, and their equivalence with the English one, can be accounted for semantically, on the basis of the underlying filter behaviour of the 'betweenness' meaning.

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The English word between is a collective preposition: it requires a set of objects, referred to either by a conjunction (1a) or by a plural noun (1b), and those objects collectively determine a location. It does not make sense to use between with a single object (1c).
(1) a. Resen is between Nineveh and Calah.
b. Resen is between the two cities.
c. *Resen is between Nineveh/a city.

Biblical Hebrew (BH) lacks the conjunctive structure in (1a) (Barr 1978; Hardy 2014; Joüon \& Muraoka 2006; Waltke, O'Connor \& O'Connor 1990). The preposition bên is possible with a single plural noun phrase, as in (2a), but when it is used with two phrases, we either find the form $\hat{u} v e ̂ n$ 'and-between' ( 2 b ) or the proclitic allative preposition $l^{\prime}$ - 'to' (2c). ${ }^{1,2}$

[^0](2) a. bên hammišas ${ }^{\text {tāyim }}$ between the-sheepfold-du 'between the sheepfolds'
b. bên nîn ${ }^{3}$ wē ûvên kālak
between Nineveh and-between Calah
'between Nineveh and Calah'
(Gen 10:12)
c. bên ṭ̂̂v $l^{\text {rāā }}$
between good to-bad
'between good and bad'
Note that this is different from the general kind of 'conjunction reduction' that we see with ordinary (non-collective) prepositions, like in the alternation of in sickness and health with in sickness and in health. What we see in (2b) and (2c) is a collective function that distributes over the elements of its plural argument and that is a surprising and puzzling phenomenon.

How does this work? How can the Hebrew PPs in (2b) and (2c) have the same meanings as the corresponding English PPs, even though their structures are quite different? An answer to this question is important for our understanding of the cross-linguistic semantics of 'between'. I consider it unhelpful to have a syntactic analysis in which BH is really like English, with an underlying conjunction between nominal objects which is then somehow 'spelled out' as $\hat{u} v e \hat{e}$ or $l^{p}$-. Instead, I take the structures of the two bên constructions at face value, as involving either a conjunction (3a) or adjunction (3b) of PPs.
(3) a. [pp bên $\mathrm{NP}_{\mathrm{a}}$ ] w- [ ${ }_{\mathrm{PP}}$ bên $\mathrm{NP}_{\mathrm{b}}$ ]
b. [ ${ }_{P P}$ bên $\left.N P_{a}\right]\left[{ }_{P P}{ }^{1}-N P_{b}\right]$
c. [ ${ }_{P P}$ between [ $\mathrm{NP}_{\mathrm{a}}$ and $\mathrm{NP}_{\mathrm{b}}$ ]]

In my proposal, the lexical meaning of between/bên conspires with the compositional interpretation of conjunction and adjunction (both as intersection) to derive the same interpretations for the structures in (3a) and (3b) as for the English structure with noun phrase conjunction in (3c). This can be shown to be based on underlying principal filter structures (Partee, ter Meulen \& Wall 1990) that are characteristic of 'betweenness'. What is at first sight a puzzling phenomenon is actually a consequence of the interaction of basic and natural semantic principles on the basis of a regular syntax.

After a brief overview of the bên patterns in BH in Section 1 I lay out the problem in a bit more detail in Section 2. Building on a few basic assumptions in Section 3, I then present the basic idea of this article in Section 4. Section 5 then shows how this idea can be formally worked out in different ways and Section 6
explores how these different ways relate to the variation found with BH bên. Section 7 concludes the article with remaining questions and wider perspectives.

## 1. Bên patterns

The Hebrew Bible contains a total of 408 instances of the item bên (Barr 1978:2). If we only count full bên PPs, with one, two, or more instances of bên, then the number is 274 . Of these constructions, there are 117 instances of bên with a single plural object (2a), 126 instances of the bên ... र̂vên ... pattern (2b), and 28 instances of the $b \hat{e} n \ldots l^{p}-\ldots$ pattern (2c). The combination $\hat{u}-l^{p}$ - 'and-to' occurs twice and $l$-vên 'to-between' only once. Cases with more than two noun phrases, like in (4), are rare.
(4) a. bênî ûvênêkem ûvên kol-nefeš
between-1S and-between-2PM and-between every-living.being 'between me and you and every living being'
b. bên-tôrā la miṣwā $\quad l^{1}$ ḥuqqîm ûl ${ }^{\rho}$ miš̌āṭ̣̂m
between-law to-instruction to-statutes and-to-ordinances 'between law and commandment, statutes and ordinances' (2 Ch 19:10)

I found only one case in the corpus with multiple conjuncts in which bên is only repeated once, while the ordinary conjunction introduces the remaining conjuncts:
(5) bên-pārān ûvên-tōfel wålāvān waḥ ${ }^{\text {a }}$ ṣērōt w $^{\top}$ dî̀zāhāv between-Paran and-between-Tophel and-Laban and-Hazeroth and-Dizahab 'between Paran and Tophel, Laban, Hazeroth, and Dizahab'

It is not possible to reconstruct the spatial configuration that the phrase refers to (because we do not know what all the placenames refer to), so unfortunately, we cannot conclude with any level of certainty that the phrase refers to a location with Paran on one side and the other places on the other side, as assumed in some commentaries and translations.

A few examples show additional prepositions before or after bên, with an initial directional contribution (Pel 'to' in (6a), min- 'from' in (6b)) or a dependentmarking role following bên ( $l^{\prime}-$ 'to' in (6a)).

$$
\begin{aligned}
\text { (6) a. } & \text { Pel-bênôt laggalgal } \\
& \text { to-between-F.PL to-the-wheels } \\
& \text { 'to between the wheels' }
\end{aligned}
$$

> b. mibbên hammizbēah ûmibbên bêt y $\quad$ y hwāh
> from-between the-altar and-from-between house Lord from between the altar and the house of the Lord'
> (2 Kings 16:14)

Barr (1978) showed that the bên ... ûvên construction typically involves concrete individual specifics (objects, places, persons), as illustrated in (7a) through English translations of some relevant examples. In the bên ... $l^{p}$ - construction on the other hand we typically find abstract classes (properties, kinds), as illustrated in ( 7 b ).
(7) a. 'the place ... between Bethel and Ai' (Gen 13:3), 'the Lord is between you and me' (1 Sam 20:23), 'war between Rehoboam and Jeroboam' ( 1 Kings 14:30),
b. 'divided between the larger and the smaller groups' (Num 26:56), 'no distinction between the holy and the profane' (Eze 22:26), 'to discern between the unclean and the clean' (Eze 44:23)

Spatial meanings are usually expressed by the bên ... ûvên construction. The nonspatial cases can be straightforwardly reciprocal, like with the war between the two kings in ( 7 a ) and with similar relational predicates (covenants, enmity, oaths, strife) or they can involve 'the expression of distinction' (Barr 1978:6 italics in the original), as illustrated in ( 7 b ). There is more to say about the different patterns and their uses, but I will not be able to do that in this short article.

## 2. The problem in more detail

As discussed in Van der Zee \& Watson (2004), some authors have assumed that spatial between is based on proximity and distance (Johnston \& Slobin 1979; O'Keefe 1996): we can say that Resen is between Nineveh and Calah if the sum of the Nineveh-Resen distance and the Resen-Calah distance is equal to the Nineveh-Calah distance. More formally, with dist as the function that gives us the distance between two towns, $\operatorname{DIST}(\mathrm{n}, \mathrm{r})+\operatorname{disT}(\mathrm{r}, \mathrm{c})=\operatorname{dist}(\mathrm{n}, \mathrm{c})$. Figure 1 shows that Resen is then somewhere on the straight line between Nineveh and Calah.


Figure 1. Between in terms of distance
Crucially, this definition of between requires 'a coordination of two proximity relations' (Johnston \& Slobin 1979:530). It needs to access both reference objects
simultaneously and it does not make sense to represent the distance $\operatorname{DIST}(\mathrm{n}, \mathrm{r})$ independently of the other two distances.

But what then is the denotation of bên nin ${ }^{0}$ we 'between Nineveh' in BH? With a little help from lambda abstraction, we can make this PP to denote a relation (8a), requiring another reference object $y$, with which it forms the property in (8b).

$$
\begin{aligned}
& \text { (8) a. bên } n i{ }^{2}{ }^{2} \text { wē } \quad \lambda y . \lambda x . \operatorname{DIST}(\mathrm{n}, x)+\operatorname{DIST}(x, y)=\operatorname{DIST}(\mathrm{n}, y) \\
& \text { b. bên nîn }{ }{ }^{2} \text { wē ûvên kālak } \lambda x \text {. } \operatorname{DIST}(\mathrm{n}, x)+\operatorname{DIST}(x, \mathrm{c})=\operatorname{DIST}(\mathrm{n}, \mathrm{c})
\end{aligned}
$$

Bên is then basically treated as a ternary predicate, a bit like a ditransitive verb, with two objects. However, what remains utterly mysterious under this analysis is why that second reference object $y$ needs to be introduced by $\hat{u} v e ̂ n$, the combination of a conjunction with the preposition bên repeated. It is also unclear how an approach like this could be made to work for the variety of patterns and uses that we saw in Section 1, with spatial and non-spatial uses, with the $\hat{u} v e \hat{e} n$ and $l^{2}$ patterns, and also with the option of having more than two objects, as in (4). It therefore makes sense to approach the interaction of the multiple parts of between constructions in a more systematic compositional way.

## 3. Some assumptions

The prepositions bên and between establish a relation between an external argument (typically a subject) and the internal argument (given by their object(s)). The internal argument of bên and between can be one plural noun phrase $(2 a) /(9 a)$ or it can be a conjunction in English $(2 b c) /(9 b)$. In BH there can be either a conjunction of two PPs (2b)/(9c) or and adjunction of two PPs (2c)/(9d). The subscripted set $\{a, b\}$ in ( 9 a ) is meant to indicate that one plural noun phrase in English and BH can refer directly to the same set $\{\mathrm{a}, \mathrm{b}\}$ of which we see the elements $a$ and $b$ distributed over conjunctions in ( $9 b c d$ ).
(9) a. $\quad \ldots{ }_{[P P}$ bên/between $\mathrm{NP}_{\{a, b\}}$ ]
b. $\quad . .\left[{ }_{\mathrm{PP}}\right.$ between $\left[\mathrm{NP}_{\mathrm{a}}\right.$ and $\left.\left.\mathrm{NP}_{\mathrm{b}}\right]\right]$
c. $\quad .$. [ ${ }_{P P}$ bên $\mathrm{NP}_{\mathrm{a}}$ ] w- $\left[{ }_{\mathrm{PP}}\right.$ bên $\mathrm{NP}_{\mathrm{b}}$ ]
d. $\quad . .\left[{ }_{P P}\right.$ bên $\left.\mathrm{NP}_{\mathrm{a}}\right]\left[{ }_{\mathrm{PP}} \mathrm{l}^{\text {P }}-\mathrm{NP}_{\mathrm{b}}\right.$ ]

The relation between external and internal argument has two parts, as shown in (10).
(10) $\mathrm{R}(\ldots$, between $(. .)$.

One part is the lexical contribution of a preposition (between in (10)), applying to its internal argument and yielding the PP denotation. The other part is a thematic role ( R in (10)) that relates this PP denotation to an external argument. For instance, spatial between is a function that maps a set of objects to their intermediary spatial region, while R is then the relation that locates another object in this region. The structure in (10) makes it possible to focus on what is specific for 'between.

Although I will use two different bold face constants between and bên for expository reasons to refer to the meanings of between and bên, I assume these to be exactly the same function (as defined in Sections 4 and 5). This allows me to explain how the different structures in (9) can express the same meaning, which is the goal of this paper. It does not explain why English and BH use different structures in the first place, i.e. why BH bên does not have conjoined objects and why English between cannot do it in the Hebrew way. In other words, the semantics overgenerates and whatever restricts this is not captured by the formal semantic definitions.

I also make the assumption that all three structures in ( 9 bcd ) involve the same intersective conjunction meaning, either contributed by an explicit conjunction ( $w$-, and) or by the adjunction structure (along the lines of Predicate Modification of Heim \& Kratzer 1998), giving us the compositional structures in (11).
a. between $\left(\mathrm{NP}_{\mathrm{a}} \cap \mathrm{NP}_{\mathrm{b}}\right)$
b. bên $\left(\mathrm{NP}_{\mathrm{a}}\right) \cap$ bên/l $\mathrm{l}^{\mathrm{O}}-\left(\mathrm{NP}_{\mathrm{b}}\right)$

If $\mathrm{NP}_{\mathrm{a}}$ are $\mathrm{NP}_{\mathrm{b}}$ are referential, then the intersection of their generalised quantifier denotations reduces to the set $\{a, b\}$ of their referents, as Winter (1998) has shown, making it possible to have the representations in (12), with individual referents a and $b$.
(12) a. between $(\{a, b\})$
b. bên $(\{a\}) \cap$ bên' $^{\prime} / l^{\mathrm{P}}-(\{b\})$

Recall that the set $\{a, b\}$ in (12a) that is derived from the intersection in (11a) can also be provided directly by one plural noun phrase, like the two cities in English, instead of through a conjunction and that this is also a possibility with BH bên. (12b) also shows an additional assumption: all the prepositional functions I consider here apply to sets, with singleton sets standing for atoms. Given these general and natural assumptions, (13) now states the fact that we need to account for by finding the right definition for the prepositional function involved.
(13) bên $(\{a\}) \cap$ bên $^{\prime} / l^{-}-(\{b\})=\operatorname{between}(\{a, b\})$

By talking about two referents a and b in this section, I deliberately exclude cases with more than two noun phrases (like in (4)) for now. I will get back to such examples in Section 6.

## 4. The basic idea

Against the background of these assumptions, consider now Examples (14a) and (14b). In (14a), the preposition bên ... ̂̂vên essentially 'marks' that Asa and Baasha function as the collective participant $\{\mathrm{a}, \mathrm{b}\}$ of the war event and in (14b) bên $\ldots l^{p}$ defines a collective participant of a discerning event that consists of the properties 'goodness' and 'badness'.
a. ûmilhāmā hāy ${ }^{\imath}$ tā bên Pāsā ûvên balšā
and-war there.was between Asa and-between Baasha
'and there was war between Asa and Baasha'
(1 Kings 15:16)
b. lhāvîn bên-ṭ̂v $l{ }^{\text {rāā }}$
to-discern between-good to-bad
'to discern between good and bad'
(1 Kings 3:9)
The predicates 'war' and 'discern' apply to these collections in very different ways, the analysis of which goes beyond the scope of this article. What is relevant for us is that the 'between' PPs in (14) create a collectivity. In working this out in a bit more detail I focus on Example (14a) now. In the corresponding English sentence, the noun war contributes a thematic role (the R in (10)) and the preposition between can then be seen as simply delivering Asa and Basha to this role as the set $\{a, b\}$. This captures the collective nature of between. As I already said, both in BH and English, this set $\{\mathrm{a}, \mathrm{b}\}$ could also be provided by means of one plural noun phrase, say $\check{s}^{2} n \hat{e} h a m m^{2} l a \bar{a} k i m$ 'the two kings' in this case. The semantics should also cover these non-coordinated cases, but the main puzzle for us is how to make it work for bên ... $\hat{u} v e ̂ n$ in such a way that it give us property (13).

We need two ingredients for this. The first ingredient is a function, sups, that maps a set $G \subseteq E$ to its set of supersets Sups $(G)$. sups $(G)$ creates what is mathematically known as the principal filter of $G$ : a non-empty subset of $\wp(E)$, the powerset of $E$, that satisfies (15a) and (15b).
(15) a. If $X \in \operatorname{sups}(G)$ and $X \subseteq Y$, then $Y \in \operatorname{sups}(G)$.
(upward monotonicity)
b. If $X, Y \in \operatorname{sups}(G)$, then $X \cap Y \in \operatorname{sups}(G)$.
(closure under intersection)
The property in (16) is a consequence of the filter structure of sups.
(16) $\operatorname{sups}(\{a\}) \cap \operatorname{sups}(\{b\})=\operatorname{sups}(\{a, b\})$


Figure 2. Singletons $\{\mathrm{a}\}$ and $\{\mathrm{b}\}$ with a superset $X$

As can be intuitively seen in Figure 2, any superset $X$ of $\{\mathrm{a}, \mathrm{b}\}$ must also be a superset of both $\{a\}$ and $\{b\}$ separately and hence be in the intersection of $\operatorname{sups}(\{a\})$ and $\operatorname{sups}(\{b\})$. Notice the similarity with (13). Intuitively, the idea is that $\operatorname{sups}(\{a\})$ gives us sets in which a is 'accompanied' by one or more other elements: 'a and something else' or '(together) with a. It is this 'comitative' property that we need for bên. The PP bên Pāsā 'between Asa' in (14) must have a denotation that leaves room for something else, like Baasha, and that denotation, when intersected with bên ba¢̌̌ā 'between Baasha' (defined in the same way), has the same denotation as between Asa and Baasha. In this way the structures that Asa and Baasha are involved in collectively (in the case of between) relate systematically to the structures that they are involved in individually (in the case of bên).

However, the function sups is not enough. We are not interested in all the supersets of $\{\mathrm{a}\},\{\mathrm{b}\}$, and $\{\mathrm{a}, \mathrm{b}\}$, but only in the minimal, smallest ones. The set $\{\mathrm{a}, \mathrm{b}, \mathrm{c}\}$ is not a minimal element in $\operatorname{sups}(\{a\}) \cap \operatorname{sups}(\{b\})$, because we also have its proper subset $\{\mathrm{a}, \mathrm{b}\}$. The second ingredient needed is therefore a function min that picks out minimal elements. With those ingredients, (17) makes explicit how we get the identity in (13).
(17) a. between $_{\text {sups }}(\{a, b\})=\operatorname{Min}(\operatorname{sups}(\{a, b\}))=\{a, b\}$
b. $\quad$ bên $_{\text {sups }}(\{a\}) \cap$ bên $/ l^{\top}{ }_{- \text {sups }}(\{b\})=\operatorname{MiN}(\operatorname{sups}(\{a\}) \cap \operatorname{sups}(\{b\}))=\{a, b\}$

We arrive at the collection $\{\mathrm{a}, \mathrm{b}\}$ via two different compositional routes. We can form the supersets of a and b separately (in the PPs) and then pick the smallest element from their intersection (the Hebrew route in (17b)) or we can directly take the smallest superset of the set $\{\mathrm{a}, \mathrm{b}\}$ itself (that we get from NP intersection, the English route in (17a)). min can be seen as a kind of 'determiner' that needs to apply, as it does in (17), to make sure that there is a unique result. Without min we would not have a well-defined region, but a set of alternative possibilities. min narrows this set down to one element. What then stops us from applying min to the two singletons separately in (17b)? The result in that case would be an empty set (18), which I assume to be an illicit denotation for a PP.
(18) $\min (\operatorname{sups}(\{a\})) \cap \min (\operatorname{sups}(\{b\}))=\{a\} \cap\{b\}=\varnothing$.

The next section shows that the basic idea shown in (17) can be made to work in different ways for 'betweenness', by having other operations than sups.

## 5. Two more betweenness varieties

### 5.1 Betweenness and convex hulls

The basic 'between' meaning is spatial: the collective spatial region of a group of objects. In order to define that region we can use the notion of a convex hull. The convex hull of two objects $a$ and $b$ is the smallest convex spatial region in which they are both located (Figure 3). This gives us an adequate characterisation of spatial betweenness (ignoring the role of vagueness): an object $c$ is only between a and b if it is located inside the grey circle, because that is the smallest convex region that contains both $a$ and $b$. If $c$ is somewhere above $a$ and $b$ or to the left of $a$, then it is not between $a$ and $b$.


Figure 3. The convex hull of $\{a, b\}$
A region is convex if for every two points $p$ and $q$ in the region the line segment connecting $p$ and $q$ is also in the region. We arrive at the convex hull of $\{\mathrm{a}, \mathrm{b}\}$ by applying two functions and we can apply those two functions in two different ways, as shown in (19). In the English situation in (19a) we first take the set of all convex regions that contain $\{\mathrm{a}, \mathrm{b}\}$ (the function regs) and then we select the smallest element of this set (the function min). In the Hebrew situation in (19b) we first form the sets of convex regions of $a$ and $b$ separately, we intersect, and we pick the smallest element from that intersection. ${ }^{3}$
(19) a. $\quad$ between $_{\text {REGS }}(\{a, b\})=\operatorname{MIN}(\operatorname{REGS}(\{a, b\}))$
b. $\quad$ bên ${ }_{\text {Regs }}(\{a\}) \cap$ bên $/ \mathbf{l}^{\top}{ }^{\text {Regs }}(\{b\})=\operatorname{MiN}(\operatorname{ReGS}(\{a\}) \cap \operatorname{REGS}(\{b\}))$

The result of (19a) and (19b) is the same region, as desired. This region is also basically the same as what we got in Figure 1 in terms of distance, because the defini-

[^1]tion of the convex hull of two objects a and b guarantees that it includes any point $p$ that is on a line connecting a and b and $\operatorname{so} \operatorname{Dist}(\mathrm{a}, p)+\operatorname{Dist}(p, \mathrm{~b})=\operatorname{DIST}(\mathrm{a}, \mathrm{b}) . \mathrm{We}$ get the same region, while doing justice to the compositional structure of the BH construction.

The regs function gives a filter structure. The set of regions that include an object $x$, for example, is monotone increasing and closed under intersection: if $x$ is in a convex region $r$ and $r$ is part of another convex region $r^{\prime}$, then $x$ is also in $r^{\prime}$ and $x$ is in convex regions $r_{1}$ and $r_{2}$ if it is in the overlap of those two regions.

There are a few wrinkles though that ultimately require more sophisticated definitions than in (19). A point is only between $a$ and $b$ if it is not in $a$ or $b$ themselves (or in concavities of a or b ) and we would need to subtract the individual regions (or the individual convex hulls) of a and b from their collective convex hull to get that effect. These are the kind of complexities that are typical for spatial meanings (Herskovits 1986), but that need not obscure the general semantics of betweenness that is captured in (19).

### 5.2 Betweenness and intervals

The preposition bên might be the grammaticalisation of a noun with the meaning 'interval' (Hardy 2014:136-38). Two (disjoint) objects a and b define a spatial interval (a line segment) connecting them and points on that line are between $a$ and $b$. This bears some similarity to the way Habel (1989) defines zwischen in terms of path structures. In order to construct a model of betweenness based on such intervals let us assume a set $L$ of line segments. The set $L$ is partially ordered: line segment $l$ can be a part of line segment $l^{\prime}$. There is a relation $I$ of intersection with objects: a line $l$ intersects with an object $x$ if it shares at least one point with it (cf. Mark \& Egenhofer 1994). Let us first take the set of all line segments SEGs(X) that intersect all the members of a set of objects $X$, like $\{a, b\}$, but also $\{a\}$ or $\{b\}$. What $\operatorname{segs}(X)$ gives us can again be seen as a principal filter: if a line $l$ intersects $X$, then so does every 'extension' of $l$ and if two lines $l_{1}$ and $l_{2}$ share a third segment $l_{3}$, then that segment is also in the filter. If we include the min operator, we can define between as in (20a), giving the set of line segments connecting the boundaries of a and b . Figure 4 shows one line $l$ from this set.


Figure 4. A line segment $l$ intersecting minimally with a and b
Exactly the same set is derived when we follow the BH route in (20b).
a. $\quad$ between $_{\text {SEGS }}(\{\mathrm{a}, \mathrm{b}\})=\operatorname{MIN}(\operatorname{sEGS}(\{\mathrm{a}, \mathrm{b}\}))$
b. $\quad$ bên $\mathbf{n}_{\text {SEGS }}(\{a\}) \cap$ bên $/ l^{0}{ }^{- \text {segs }}(\{b\})=\operatorname{MIN}(\operatorname{SEGS}(\{a\}) \cap \operatorname{SEGS}(\{b\}))^{4}$

Allowing intervals to be curved and directed would give us something like Habel's path structures for 'between', but working that out would take us too far, although paths are what we ultimately need to explain the appearance of the allative $l^{p}$ - 'to' in bên constructions (see Section 6.2).

## 6. Back to the Hebrew patterns

We have seen three different ways to define 'betweenness' that support both the English and the Hebrew compositional route. This shows that the general semantic principle proposed in this paper can be implemented in different ways. It does not rely on one particular semantics of betweenness but it is a part of a more general structural property of collectivity (corresponding to underlying principal filters). Now the question is: how much of this theoretical variety is necessary to do justice to the empirical variety that we observe with between and, especially, with bên? I can only scratch the surface by highlighting some possibilitities.

### 6.1 Spatial and non-spatial

Both English between and Hebrew bên have spatial and non-spatial uses. A war between Asa and Baasha or a choice between good and bad cannot be analysed in terms of common regions or connecting line segments or shared paths. That is where the sups version comes in, that allows a between/bên PP to denote a set of entities. It is the higher predicate (referring to wars or choices) that requires a collection and that is what the non-spatial between/bên phrase gives them. This way of analysing this thematic collectivity is very likely too crude, but something like the sups variant is definitely needed.

## 6.2 ûvên and $\mathrm{l}^{\text {² }}$ -

The difference between spatial and non-spatial betweenness does not coincide with the difference between the two bên constructions in BH. Although most of

[^2]the spatial uses go with the $\hat{u} v e ̂ n$ construction, we do find some spatial examples with $l^{\circ}-$, like (21). ${ }^{5}$
(21) ûvên Yaliyyat happinnā lšafar hașṣōn
and-between upper.chamber the-corner to-gate the-flock
'and between the upper chamber of the corner and the Sheep Gate' (Neh 3:32)

What is the most appropriate model for these spatial uses? Given the etymology of bên as 'interval' and the usual meaning of $l$ ' as 'to', it seems that the line segment model (and ultimately the path model) is the best choice, because the preposition $l$ - suggests that there is an interval or path running 'from' the first object 'to' the second object. This also corresponds with the fact that $l^{p}$ - is never the first preposition.

### 6.3 Two and more

At first sight, the convex hull model then seems superfluous: the line segment model already works well and is also diachronically motivated. However, we need to realise that the line segment model is limited to situations with two objects. We can draw a line through two objects, but as soon as we need to model the intermediary space of three or more objects, the line segment model does not work anymore. (Unfortunately, there are no examples of spatial bên with more than two objects in the Biblical corpus to illustrate this with, but I assume that such cases are possible and that we want our semantics to cover such cases.) The regionbased model operates without problem on situations with more than two objects. If we start with three objects $a, b$, and $c$, then we first take the set of convex regions for each of them: $\operatorname{Regs}(\{a\}), \operatorname{Regs}(\{b\})$, and $\operatorname{Regs}(\{c\})$. Then we take the intersection of this: $\operatorname{REGS}(\{a\}) \cap \operatorname{REGS}(\{b\}) \cap$ and $\operatorname{REGS}(\{c\})$, which will necessarily only contain the regions that include $\{a, b, c\}$. If we then take the minimum, we get the convex hull of $\{a, b, c\}$. It works in the same way with more than three objects.

However, this is not the whole story, as a more careful look at the few examples with multiple objects shows. Consider Example (22) that talks about a covenant between God on the one hand and Abraham and his descendants on the other hand.

[^3](22) bênî ûvênekāâvên zarçakā
between-1S and-between-2S and-between seed-2S
'between me and you and your descendants'
Because all three objects have their own bên, our set-based semantics for this non-spatial use derives the collection $\{i, y, d\}$, which looks more like a covenant between three 'partners'. Instead the structure $\{i,\{y, d\}\}$ seems more appropriate, with $\{y, d\}$ representing the group of Abraham and his descendants with which God has his covenant. There is an issue here that involves coordination more generally: should we allow or require coordination to create structured pluralities (Landman 1989) or is it pragmatics that gives us this structure on top of 'flat', non-structured pluralities (Schwarzschild 1996)? I will leave this as an open problem for future work.

### 6.4 Three different models for a complete picture

The semantic (and diachronic) picture with BH bên might be at follows. Prepositional bên constructions must have at least started with a spatial, 'line-based' semantics, given what we know about the other meanings of bên 'interval' and $l^{p}$ 'to'. The set of lines connecting two objects a and b defines the same intermediary portion of space that can also be defined by means of the convex hull of $\{a, b\}$. But this region-based model is more general (applying to more than two objects) and it is a bit easier to see how it can be extended to a non-spatial set-based version of the same generality (cf. the close relation between sets and regions in Euler diagrams).

## 7. Conclusion

This article presented a detailed semantic analysis of a preposition in Biblical Hebrew. How does this extend to other languages and varieties? We know that similar constructions exist in Modern Hebrew and in other Semitic languages (Arabic in particular). A query on the LinguistList did not yield many examples from languages beyond that group. Older stages of Romanian seem to feature the construction (23a) (Dindelegan 2016:431), but it is also found in Dutch (23b) (Haeseryn et al. 1997: 629; van der Wouden 2015: 6-7), even where influence from

Biblical Hebrew through the literal Dutch Statenvertaling is unlikely (van der Horst 2008:1223). ${ }^{6}$
(23) a. între mine şi între tot trupul between me.ACC and between all people.def.acc 'between myself and all people'
b. Er is een groot verschil tussen chimpansees en tussen gorilla's. 'There is a big difference between chimpansees and gorillas.'

I suspect that the phenomenon is cross-linguistically broader than Biblical Hebrew, but mapping that out is a task for future research.

The goal of this article was rather modest: to explain how the Biblical Hebrew bên constructions can have the same meaning as the English between construction. Another cluster of questions concerns the 'why' of these constructions: why does BH do it in this way and not in the English way? And why is the BH type construction impossible in English? Answering such questions would require a larger database, with many more languages, enabling us to identify explanatory factors, either synchronic or diachronic. Another issue concerns the differences between the $\hat{u} v \hat{e} n$ and the $l^{p}$ - construction (Barr 1978), that go beyond the different semantic models discussed in this article and that require a consideration of issues of referentiality and different types of coordination, maybe along the lines of accidental ('heavy') coordination and natural ('light') coordination (Haspelmath 2007; Wälchli 2009). Finally, there is much more to say about the finer details of 'between' location (van der Zee \& Watson 2004) and 'between' collectivity for which we would need to go beyond a corpus-based study. Nevertheless, this paper has shown that the details of a language that have usually only drawn attention from Biblical scholars lend themselves to a fruitful application of formal semantic methods that can open up new insights and questions.

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## References

Barr, James. 1978. "Some notes on ben "between" in Classical Hebrew." Journal of Semitic Studies 23(1): 1-22. https://doi.org/10.1093/jss/23.1.1
Dindelegan, Gabriela Pană (ed). 2016. The Syntax of Old Romanian. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198712350.001.0001
Elliger, Karl \& Rudolph, Willhelm (eds). 1977. Biblia Hebraica Stuttgartensia. Stuttgart: Deutsche Bibelgesellschaft.
Habel, Christopher. 1989. "Zwischen-Bericht." In Raumkonzepte in Verstehensprozessen, Christopher Habel, Michael Herweg \& Karl Rehkämper (eds), 37-69. Tübingen: Niemeyer. https://doi.org/10.1515/9783111354620.37
Haeseryn, W., Romijn, K., Geerts, G., de Rooij, J. \& van den Toorn, M. C. 1997. Algemene Nederlandse Spraakkunst. Tweede, Geheel herziene druk. Groningen/Deurne: Martinus Nijhoff Uitgevers/Wolters Plantyn.
Hardy, Humphrey Hill. 2014. "Diachronic development in Biblical Hebrew Prepositions: A case study in grammaticalization." PhD dissertation, University of Chicago.
Haspelmath, Martin. 2007. "Coordination." In Language typology and syntactic description, vol. II: Complex constructions, Timothy Shopen (ed), 2nd ed., 1-51. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511619434.001
Heim, Irene \& Kratzer, Angelika. 1998. Semantics in Generative Grammar. Oxford: Blackwell.
Herskovits, Annette. 1986. Language and Spatial Cognition: An Interdisciplinary Study of the Prepositions in English. Cambridge: Cambridge University Press.
Johnston, Judith R. \& Slobin, Dan I. 1979. "The development of locative expressions in English, Italian, Serbo-Croatian and Turkish." Journal of Child Language 6(3): 529-45. https://doi.org/10.1017/S030500090000252X
Joüon, Paul \& Muraoka, Tamitsu. 2006. A Grammar of Biblical Hebrew. Rome: Gregorian \& Biblical Press.
Landman, Fred. 1989. "Groups, I." Linguistics and Philosophy 12(5): 559-605. https://doi.org/10.1007/BF00627774
Mark, David \& Egenhofer, Max J. 1994. "Modeling Spatial Relations between Lines and Regions: Combining Formal Mathematical Models and Human Subjects Testing." Cartography and Geographical Information Systems 21(3): 195-212.
O'Keefe, John. 1996. "The spatial prepositions in English, Vector Grammar and the Cognitive Map Theory." In Language and Space, Paul Portner, Mary A. Peterson, Nadel Lynn \& Merrill F. Garrett (eds), 277-316. Cambridge, MA: MIT Press.
Partee, Barbara H., ter Meulen, Alice \& Wall, Robert E. 1990. Mathematical Methods in Linguistics. Dordrecht: Kluwer.

Schwarzschild, Roger. 1996. Pluralities. Dordrecht: Kluwer.
https://doi.org/10.1007/978-94-017-2704-4
van der Horst, Joop M. 2008. Geschiedenis van de Nederlandse Syntaxis. Leuven: Universitaire Pers Leuven.
van der Wouden, Ton. 2015. "Tussen andere lezingen." Paper presented at the the annual meeting of the Linguistic Society of the Netherlands, 7 February 2015, Utrecht.
van der Zee, Emile \& Watson, Matt. 2004. "Between space and function: How spatial and functional features determine the comprehension of between." In Functional Features in Language and Space: Insights from Perception, Categorization, and Development, Laura Carlson \& Emile van der Zee (eds), 116-27. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199264339.003.0008
Wälchli, Bernhard. 2009. Co-Compounds and Natural Coordination. Oxford: Oxford University Press.
Waltke, Bruce K., O'Connor, Michael Patrick \& O'Connor, Caroll. 1990. An Introduction to Biblical Hebrew Syntax. Winona Lake, Indiana: Eisenbrauns.
Winter, Yoad. 1998. "Flexible Boolean Semantics: Coordination, Plurality and Scope in Natural Language." Doctoral dissertation, Utrecht University.

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[^0]:    1. The conjunction ( $w-$ ) is $\hat{u}$ - before the labial $b$ of bên that itself shows spirantisation to $v$, hence the form ûvên.
    2. All the BH examples in this article are from the Biblia Hebraica Stuttgartensia (Elliger \& Rudolph 1977), accessed through and largely following the transcription of the SHEBANQ project (https://shebanq.ancient-data.org/).
[^1]:    3. In the case of $\min (\operatorname{Regs}(\{a\}))$, the convex hull of a single object a, we get a spatial denotation that corresponds to a preposition like in (e.g., with a bird in a tree, that is, between its branches).
[^2]:    4. What about $\min (\operatorname{segs}(\{a\}))$ ? If we allow points as the smallest possible line segments, then this gives us the boundary of object a. This corresponds to the English preposition on. Like we saw earlier (footnote 3), with individual objects, the 'between' models 'degenerate' to other familiar spatial functions for which more basic prepositions are available.
[^3]:    5. This spatial use of $l^{0}$ - is found in Late Biblical Hebrew. Thanks to Elitzur Bar-Asher Siegal for pointing this out to me. See also Barr (1978) for some discussion of this factor. Obviously, there is much more to say about the diachrony of the different bên constructions.
[^4]:    6. I am grateful to Ion Giurgea for directing me to the Romanian example and to Ton van der Wouden for making me aware of the Dutch example and discussion.
