

Transparency in Modern Hebrew: A Functional Discourse Grammar analysis*

Mijke Mulder
University of Amsterdam

The degree of transparency of Modern Hebrew is assessed by means of a transparency test that has been developed based on the framework of Functional Discourse Grammar. It appears that Modern Hebrew is a highly opaque language, exhibiting only one fully transparent feature that is included in the test: no tense-copying. It also turns out that the distribution of transparent features in Modern Hebrew aligns with previous results from Dutch, Quechua, Kharia, and Sri Lanka Malay. A hierarchy of Opacity Resistance is therefore proposed, ranking the transparent features from high resistant to low resistant. The Modern Hebrew data seem to suggest that lacking tense-copying is the most opacity-resistant transparent feature of all.

1 Introduction

The main purpose of the present article is to answer the following question: how transparent is Modern Hebrew? A clear definition of transparency is needed to be able to answer this question. I will adopt Functional Discourse Grammar (FDG, Hengeveld and Mackenzie 2008) as a framework and I will use the ‘transparency test’ developed by Hengeveld (2011a), where transparency is defined as a one-to-one relationship between meaning and form. FDG proposes four levels of grammar, namely an Interpersonal, Representational, Morphosyntactic, and Phonological Level. The Interpersonal and Representational Levels concern the formulation of discourse acts, and the Morphosyntactic and Phonological Levels concern their encoding (Hengeveld and Mackenzie 2008: 2). The opposite of transparency, opacity, is then defined as a one-to-many relationship between levels, or a one-to-zero relationship when material is inserted at a lower level that has no counterpart at a higher level of grammar. By applying the transparency test to Modern Hebrew, we can compare its degree of transparency to other languages that have been subjected to the same test, namely Dutch (Hengeveld 2011b), Quechua (Grández Ávila 2011), Kharia (Leufkens 2011), Sri Lanka Malay (Nordhoff 2011), and Esperanto (Jansen 2011).

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A second purpose of this article is to answer the question whether the distribution of transparent characteristics of Modern Hebrew aligns with the distribution found in other languages. Hengeveld (2011b) tentatively ranks transparent features according to their strength to resist opacity. The outcomes of the transparency test for Dutch, Quechua, Kharia, and Sri Lanka Malay nicely align and allow us to propose such a hierarchy, which I will call the Opacity Resistance hierarchy here. The outcomes for Esperanto, however, do not align as nicely with the distribution of transparent features in the other languages. Hengeveld (2011b: 113) ascribes the deviant behavior of Esperanto to the fact that, though the language has been designed to be transparent, syntactic transparency is lacking because it was neglected during the designing process. I will show that Modern Hebrew is not like Esperanto: the distribution of transparent features aligns perfectly with the distribution found in the other languages. Furthermore, the Modern Hebrew data can possibly help us to fine-tune the Opacity Resistance hierarchy.

Modern Hebrew is one of the official languages of the State of Israel. Ethnologue estimates the number of speakers at more than five million worldwide, of which the vast majority resides in Israel.¹ Modern Hebrew, also called Israeli Hebrew or Modern Israeli Hebrew, is a Semitic language and is related, amongst others, to the Arabic languages, Aramaic, and Amharic. The Semitic languages are part of the Afro-Asiatic phylum. The Hebrew language has a quite remarkable history: after being used exclusively as a written language from approximately the second or third century AD, the language was revived as a spoken language at the end of the nineteenth century and the beginning of the twentieth century (Glinert 2004: 1–2). It is now used as a language of communication in all domains of Israeli life.

A striking feature of Modern Hebrew and Semitic languages in general is that they exhibit so-called root-pattern morphology. This means that the majority of Modern Hebrew words can be reduced to a consonantal root, usually consisting of three phonemes, to which vowel patterns (i.e. transfixes) and other affixes are attached. Though most scholars adopt this root-based analysis of Semitic morphology, some prefer to take an approach that could be called the word-based approach. The latter dismiss the need for a consonantal root.² I will adopt the dominant root-based view here.

¹ www.ethnologue.com, accessed 8-8-2013.

² For a brief description of these two different approaches to Semitic morphology, see Ussishkin (2006a). In the same issue of *Morphology*, the following articles are devoted to the question whether Semitic morphology is root-based or word-based: Prunet (2006), Kihm (2006), Ussishkin (2006b), and Ravid (2006).

In this article, Modern Hebrew will be subjected to the transparency test designed by Hengeveld (2011a). This test consists of a list of transparent features and for every feature it is checked whether the language exhibits it or not. I will start with transparency between levels, moving down through the levels of grammar: Section 2 discusses transparent mapping between the Interpersonal and Representational Level, Section 3 discusses the mapping from higher levels onto the Morphological Level, and Section 4 deals with the mapping from higher levels onto the Phonological Level. Opacity is not only created by asymmetric mapping between levels, it can also be introduced within levels, when material is inserted at that level which has no counterpart at higher levels. Section 5 therefore discusses opacity introduced at the Morphological Level, and Section 6 concludes the transparency test by discussing opacity introduced at the Phonological Level. It will become clear that Modern Hebrew is a highly opaque language, as it exhibits only one or two of the transparent features included in this survey and is non-transparent with respect to the remaining features. In Section 7, I will discuss the degree of transparency of Modern Hebrew and also the degree of resistance to opacity of the separate features that figure in the transparency test. Finally, in Section 8, I will summarize the findings, draw conclusions, and make suggestions for further research.

2 Interpersonal-Representational

In this section, the transparency of the mapping between the two formulation levels will be discussed. The transparent features that will be considered are: no apposition, no cross-reference, and no limitation on which semantic units can be chosen as predicates. All three features are examples of a transparent relationship between the Interpersonal and the Representational Level.

2.1 No apposition

When a single Referential Subact at the Interpersonal Level corresponds to a single Individual at the Representational Level, the mapping between the two levels is transparent. When, on the contrary, one Individual corresponds to two Referential Subacts, a construction which we call apposition, the relation between the two levels is opaque. We only speak of apposition when each of the two Noun Phrases (NP), reflecting two Subacts at the Interpersonal Level, can stand on its own. The following sentence in Dutch, therefore, does not contain an instance of apposition:

- (1) **Wij twee** zijn het beste team.
we two are the best team
 ‘The two of us are the best team.’

The words *wij* ‘we’ and *twee* ‘two’ in (1) refer to the same entity, but contrary to *wij*, the word *twee* cannot stand alone, indicating that in this case we have one Referential Subact and not two. The following example shows that leaving out *wij* ‘we’ results in an ungrammatical sentence:

- (2) * **Twee** zijn het beste team.
two are the best team

Modern Hebrew allows apposition and is non-transparent in this respect. Consider the following example (Coffin and Bolozky 2005: 260):

- (3) **Ha-xaver shel-i jonatan** hexlit
DEF-friend of-1.SG Jonathan decide.PST.3.M.SG

 le-hitstaref ele-nu.
 INF-join to-1.PL
 ‘My friend Jonathan decided to join us.’

The NP *haxever sheli* ‘my friend’ corresponds to one Subact, and the NP *jonatan* ‘Jonathan’ corresponds to a second Subact. Both NP’s can function as an independent unit. When they are used on their own, the sentence remains grammatical (Coffin and Bolozky 2005: 260):

- (4) **Ha-xaver shel-i** hexlit le-hitstaref ele-nu.
DEF-friend of-1.SG decide.PST.3.M.SG INF-join to-1.PL
 ‘My friend decided to join us.’

 (5) **Jonatan** hexlit le-hitstaref ele-nu.
Jonathan decide.PST.3.M.SG INF-join to-1.PL
 ‘Jonathan decided to join us.’

Although Modern Hebrew allows apposition, i.e. a non-restrictive relationship between Subacts, the restrictive type of relationship is more frequent than the loose, non-restrictive type. Apposition is clearly not as frequent in Hebrew as in apposition-rich languages like Quechua (cf. Grández Ávila 2011: 25–26) or Yimas (A language of Papua New Guinea, cf. Foley 1991: 188). Nevertheless, employing a strict definition of transparency, we have to conclude that Modern

Hebrew is opaque with respect to the relation between Subacts at the Interpersonal Level and Individuals at the Representational Level.

2.2 *No cross-reference*

Cross-reference is a subtype of apposition. We speak of cross-reference when person marking on the verb corresponds to a Referential Subact at the Interpersonal Level. Because such person marking is referential, it may stand on its own. Lexical expression of the argument that is encoded on the verb is optional (see Hengeveld and Mackenzie 2008: 350). It does not matter whether the argument is expressed as a full NP or as a pronoun. When referential person marking on the verb co-occurs with lexical expression of the same argument, we have two Subacts at the Interpersonal Level that link to only one unit at the Representational Level: a non-transparent relationship. A transparent relationship is obtained when a language has no referential person marking on the verb, i.e. it always requires a lexically realized argument (Hengeveld and Mackenzie 2008: 350).

Modern Hebrew does exhibit cross-reference, as is shown by the following example (well-known from Arik Einstein's song *ani veata*):

- (6) **Ani ve-ata ne-shane et ha-olam.**
1.SG and-2.SG 1.PL-change.FUT OBJ DEF-world
 'You and me will change the world.'

The subject argument is expressed lexically as *ani veata* 'I and you' and at the same time encoded grammatically on the verb by *ne-* '1.PL'. That the person marker on the verb is referential in this case, is proved by the following example, lacking a lexically expressed subject argument (internet):

- (7) **Beyaxad ne-shane et ha-olam.**
together 1.PL-change.FUT OBJ DEF-world
 'Together we will change the world.'

In (7), the subject argument is expressed only on the verb, so the person marker *ne-* '1.PL' must be referential. Allowing cross-reference is a non-transparent feature of Modern Hebrew.

2.3 *No limitation on which semantic units can be chosen as predicates*

Predication takes place at the Interpersonal Level by evoking Ascriptive Subacts. When a Ascriptive Subact is allowed to map onto any semantic

category at the Representational Level, i.e. without restrictions, we consider the mapping between the two levels to be transparent. Limitations on which semantic units can be chosen as predicates render the mapping of Ascriptive Subacts to the Representational Level opaque.

In Modern Hebrew, verbs, adjectives, nouns, prepositional phrases, and adverbial expressions can act as head of a predicate (see Coffin and Bolozky 2005: 318). Verbs agree with the subject of the clause in person, number, gender, and tense/aspect.³ Adjectives that function as the head of a predicate agree with the subject in gender and number, but not in definiteness as is the case when they act as modifier in a noun phrase.

An example of a verbal predicate (Coffin and Bolozky 2005: 315):

- (8) Ha-hor-im **rashm-u** et ha-ylad-im
 DEF-parent-PL **register-PST.3.PL** OBJ DEF-child-PL
- le-shiur-ey hitamlut.
 to-class-PL.CS gymnastics

‘The parents registered their kids for gym classes.’

An example of an adjective that functions as predicate (Glinert 2004: 20):

- (9) Ha-hod-im **xaxam-im.**
 DEF-Indian-PL **clever-M.PL**
 ‘Indians are clever.’

An example of a noun phrase that functions as predicate (Coffin and Bolozky 2005: 318):

- (10) Ha-seret haze **seret** **metsuyar.**
 DEF-movie this **movie** **drawn.M.SG**
 ‘This movie is an animated film.’

Both prepositional phrases in the following example function as predicates (Coffin and Bolozky 2005: 318):

³ However, some verb forms are gender-neutral and no person agreement occurs in the present tense. An example of a gender-neutral verb form is found in sentence (7).

- (11) Nash-im **mi-noga** u-gvar-im mi-madim.
 woman-PL **from-Venus** and-man-PL from-Mars
 ‘Women are from Venus and men are from Mars.’

Finally, an example of an adverb that functions as predicate (adapted from Coffin and Bolozky 2005: 320):

- (12) Ha-pgisha **maxar**.
 DEF-meeting **tomorrow**
 ‘The meeting is tomorrow.’

Notice that no copula appears in examples (9) to (12), and that all four sentences are translated with the present tense. In Modern Hebrew, when the clause has a present tense meaning (or so-called universal tense), the use of a copula is optional. The optional present tense copula consists of the third person pronouns: *hi* ‘she’, *hu* ‘he’, *hem* ‘they(M)’, and *hen* ‘they(F)’.⁴ This is what examples (9) to (12) look like when the appropriate copula is inserted (Coffin and Bolozky 2005: 318–320):

- (13) Ha-hod-im **hem** xaxam-im.
 DEF-Indian-PL **COP.3.M.PL** clever-M.PL
 ‘Indians are clever.’
- (14) Ha-seret haze **hu** seret metsuyar.
 DEF-movie DEM.M.SG **COP.3.M.SG** movie drawn.M.SG
 ‘This movie is an animated film.’
- (15) Nash-im **hen** mi-noga u-gvar-im hem mi-madim.
 woman-PL **COP.3.F.PL** from-Venus and-man-PL **COP.3.M.PL** from-Mars
 ‘Women are from Venus and men are from Mars.’
- (16) Ha-pgisha **hi** maxar.
 DEF-meeting **COP.3.F.SG** tomorrow
 ‘The meeting is tomorrow.’

⁴ The example sentences (13) to (16) all contain a third person subject. However, the third person pronouns are also optionally used as copulas with first and second person subjects in spoken Hebrew, provided that the nominal predicate is definite (Coffin and Bolozky 2005: 319).

While the use of a copula is optional in the above three sentences, in certain other contexts the insertion of a copula is obligatory. When a clause refers to an event or state in the past or future, a form of the verb *lihyot* ‘to be’ has to be placed between the subject and the predicate in order to mark the tense of that clause. The following two sentences contain a past tense (17) and a future tense (18) copula (Coffin and Bolozky 2005: 319):

- (17) Ha-seret ha-yashan **haya** maravon.
 DEF-movie DEF-old.M.SG **be.PST.3.M.SG** Western
 ‘The movie was a Western.’
- (18) Ha-tguva shel ha-kahal **tihye** xiuvi-t.
 DEF-response of DEF-audience **be.FUT.3.F.SG** positive-F.SG
 ‘The audience’s response will be positive.’

As the examples that are quoted in this paragraph show, there do not seem to be any limitations as to which semantic units can be picked as predicates. In that respect, Modern Hebrew is a transparent language. At the same time, the obligatory and optional copulas constitute a non-transparent feature. The copulas are acting as dummy elements, an empty building block to which person, number, and gender markers can be attached. Dummy elements or expletives do not have a representation at a higher levels in the Grammatical Component and therefore represent an opaque feature of language.

3 Interpersonal/Representational-Morphosyntactic

This section will discuss the transparency of the relationship between the formulation levels on the one hand and the highest encoding level, the Morphosyntactic Level, on the other. The cases of transparent mapping that will be considered are no grammatical relations, no discontinuity, and no sensitivity of function marking for the nature of input.

3.1 *No grammatical relations*

There are two types of transparent alignment systems. The first is pragmatic alignment: when morphosyntactic organization reflects the organization of units at the Interpersonal Level. In a pragmatic alignment system, pragmatic functions like Topic and Focus are marked consistently by morphosyntax. The second is semantic alignment: when morphosyntactic organization reflects the organization of units at the Representational Level. In a semantic alignment

system, semantic roles like Actor and Undergoer are marked consistently by morphosyntax. Pragmatic and semantic alignment involve unhindered mapping from the higher levels to the lower level of morphosyntax; these alignment systems are not distorted by syntactic configuration and are therefore considered transparent. Morphosyntactic alignment on the other hand, i.e. a system that involves grammatical relations, is opaque. In this third type of alignment, the morphosyntactic organization does not reflect a higher level organization of units, but instead uses syntactic functions like Subject and Object. This means that a grammatical relation may correspond to different pragmatic or semantic functions. In other words, distinctions between pragmatic or semantic categories are neutralized by grammatical relations.

Modern Hebrew exhibits morphosyntactic alignment. The grammatical relation Subject can neutralize the distinction between the semantic roles Actor and Undergoer, as the following examples show. In the sentence below, we have a Subject-Actor:

- (19) Ha-gever rats.
 DEF-man run.PST.3.M.SG
 'The man ran.'

In (19) the syntactic function Subject coincides with the semantic role Actor, but we can also have a Subject-Undergoer:

- (20) Ha-gever yashan.
 DEF-man sleep.PST.3.M.SG
 'The man slept.'

The constituent *hagever* 'the man' stands in the same position and is marked on the verb in the same way in both examples, while its semantic role is Actor in (19) but Undergoer in (20).

Passive constructions also neutralize the distinction between those two semantic roles, and Modern Hebrew allows passivization. The following example shows a typical two-place predication with a Subject-Actor and an Object-Undergoer, an active clause:

- (21) Ha-gever daras et ha-xatul.
 DEF-man run.over.PST.3.M.SG OBJ DEF-cat
 'The man ran over the cat.'

- (24) Ha-sipur-im amurim b-eyzeshehu ofen
 DEF-story-PL should.M.PL in-some way

 leshakef et ha-metsiut.
 reflect.INF OBJ DEF-reality
 ‘The stories should in some way reflect reality.’

The word *amurim* ‘should(M.PL)’ in (24) functions as an auxiliary and *leshakef* ‘to reflect’ is the main verb. This VP is interrupted by the Adverb Phrase *beyzeshehu ofen* ‘in some way’. The fact that the sequence *leshakef et hametsiut* ‘to reflect reality’ cannot be replaced by a pronoun proves that *amurim* is truly acting as an auxiliary here:

- (25) *Ha-sipurim amurim et ze.
 DEF-story-PL should.M.PL OBJ that

Examples (23) and (24) above concern discontinuity at the level of syntax, but discontinuity may also be found at the level of morphology. Hengeveld and Mackenzie (2008: 286) mention that domain integrity is usually well respected in morphology. Modern Hebrew, like all other Semitic languages, forms an exception: transfixes (also called ‘ablaut’ or ‘vowel patterns’) are ubiquitous. Most Semitic words can be reduced to a consonantal root, usually consisting of three phonemes, to which vowel patterns and other affixes are attached (see introduction).

The following examples, containing the verb *shilem* ‘he paid’ and its passive counterpart *shulam* ‘he/it was paid’, show how Modern Hebrew violates domain integrity at the level of morphology (Coffin and Bolozky 2005: 96):

- (26) Dan lo **shilem** le-ron et ha-kesef.
 Dan not **pay.PST.3.M.SG** to-Ron OBJ DEF-money
 ‘Dan did not pay Ron the money.’

 (27) Ha-kesef lo **shulam** alydey ron.
 DEF-money not **pay.PST.PASS.3.M.SG** by Ron
 ‘The money was not paid by Ron.’

The root of the words in boldface in (26) and (27) is *sh-l-m*. By applying the transfix *i-e* to this root, the active past stem of the so-called pi’el conjugation is formed. Its passive counterpart in (27) is created by applying the transfix *u-a*.

Modern Hebrew exhibits discontinuity in syntax and even more so in morphology. The language can be called highly opaque in that respect.

3.3 *Function marking not sensitive to the nature of input*

Transparent function marking is attained when a function can be expressed by the same marker on any constituent, regardless of the complexity or type of that constituent. This unrestricted, transparent relationship is found in languages that employ phrase marking (Hengeveld 2011: 14). Function marking is considered opaque when a function can only be expressed on constituents of a specific type or degree of complexity. This is what we observe in head marking languages.

As far as I am aware, every function marker in Modern Hebrew is in some way restricted; the language is opaque in that respect. The following example shows how an NP Object is marked differently from a complement clause (Coffin and Bolozky 2005: 340):

- (28) David shama **she**-ha-mishtara xokeret
 David hear.PST.3.SG **COMP**-DEF-police investigate.PRS.F.SG
et ha-matsav.
OBJ DEF-situation
 ‘David heard that the police was investigating the situation.’

The complement clause *hamishtara xokeret et ha matsav* ‘the police was (lit.: ‘is’) investigating the situation’ and the NP object inside that same clause, *hamatsav* ‘the situation’, both carry the semantic function of Undergoer, yet the former is marked with *she-* ‘that’ and the latter with the object marker *et*. The form of the marker not only depends on the complexity of the constituent it attaches to (NP or clause), but also on definiteness of the NP. When an indefinite NP acts as an object, the use of a marker is not allowed (Coffin and Bolozky 2005: 225):

- (29) Ha-mishtara tafsa shney ganav-im.
 DEF-police catch.PST.3.F.SG two thief-PL
 ‘The police caught two thieves.’

Notice that in (29) no object marker appears between the verb *tafsa* ‘she caught’ and the Object NP *shney ganavim* ‘two thieves’. Placing an object marker before an indefinite NP renders the sentence ungrammatical:

- (30) *Ha-mishtara tafsa et shney ganav-im.
 DEF-police catch.PST.3.F.SG OBJ two thief-PL

The examples show that function marking is sensitive to the nature of input in Modern Hebrew; this is an opaque feature of the language.

4 Interpersonal/Representational/Morphosyntactic-Phonological

This section will deal with the mapping of units from the higher levels of grammar onto the lowest encoding level, the Phonological Level. The transparent features that will be discussed are parallel phonological and morphosyntactic phrasing, and no influence of phonological weight on morphosyntactic placement.

4.1 Phonological phrasing and morphosyntactic phrasing run parallel

A language is considered transparent with respect to this feature when the mapping of morphosyntactic units onto units at the Phonological Level is one-to-one (Hengeveld 2011: 14). When, for instance, a single Morphosyntactic Word corresponds to a single Phonological Word, the mapping is transparent. Opaque mapping, on the other hand, occurs when a single morphosyntactic unit corresponds to more than one phonological unit, or the reverse, when a single phonological unit corresponds to more than one morphosyntactic unit. An example of such an asymmetrical relationship is found when more than one Morphosyntactic Word maps onto a single Phonological Word. At phrase level, a transparent relationship is attained when a single Morphosyntactic Phrase corresponds to a single Phonological Phrase.

Modern Hebrew allows clitics and therefore shows asymmetry between phonological and morphosyntactic phrasing. Clitics are an example of a non-transparent mapping between the Morphosyntactic and Phonological Level because they are morphosyntactic words that are phonologically dependent. At the Morphosyntactic Level a clitic is treated as a word, in contrast to the Phonological Level, where it is not an independent unit, but instead forms a phonological word together with the element that it attaches to (Hengeveld and Mackenzie 2008: 446). Modern Hebrew possesses personal pronoun clitics, which attach to a wide variety of word classes: prepositions, nouns, adverbs, verbs, and certain particles (see Coffin and Bolozky 2005: 168). I will here give

an example of an existential particle⁵ with a cliticized pronoun (Borer 1981: 306):

- (31) Ha-yalda **yesh-na** ba-gan.
 DEF-girl **EXIST-3.F.SG** in.DEF-garden
 ‘The girl is in the garden.’

The personal pronoun clitic *-(n)a* ‘she’ is attached to the existential particle *yesh* ‘there is/are’. Not only the third person singular feminine pronoun can be fixed to this existential particle, but also every other form in the personal pronoun paradigm (Coffin and Bolozky 2005: 166–167). This example shows that Modern Hebrew allows cliticization of the personal pronoun; it is in that respect a non-transparent language.

4.2 *Phonological weight does not influence morphosyntactic placement*

A fully transparent language does not let phonological weight influence the order of constituents. Instead, linear order relies entirely on the alignment system of that language. As Belletti and Shlonsky (1995) show, phonological weight influences the position of the Object and the prepositional argument in Modern Hebrew, in the sense that heavy constituents enjoy more freedom than light constituents. The most basic order is Object-prepositional argument as in the following sentence (Belletti and Shlonsky 1995: 489):

- (32) Henaxti et ha-sefer hahu al ha-shulxan.
 put.PST.1.SG OBJ DEF-book that on DEF-table
 ‘I put that book on the table.’

In the above example, *hasefer hahu* ‘that book’ functions as Object and precedes the prepositional argument *al hashulxan* ‘on the table’. The reverse order, prepositional argument-Object, is completely grammatically acceptable, provided that the Object is a heavy constituent (Belletti and Shlonsky 1995: 489):

- (33) Henaxti al ha-shulxan et ha-sefer hahu.
 put.PST.1.SG on DEF-table OBJ DEF-book that
 ‘I put that book on the table.’

⁵ The syntactic behavior of Modern Hebrew existential particles, with and without cliticized personal pronoun, is described in depth by Borer (1981: 304–340).

When the Object is not a full NP, for example *oto* ‘him/it’, the order Object-prepositional argument is the only grammatical order:

- (34) Henaxti oto al ha-shulxan.
 put.PST.1.SG OBJ.3.M.SG on DEF-table
 ‘I put it on the table.’

Contrary to the full NP *hasefer hahu* ‘that book’, the light Object *oto* ‘him/it’ cannot be placed directly to the right of the prepositional argument:

- (35) *Henaxti al ha-shulxan oto.
 put.PST.1.SG on DEF-table OBJ.3.M.SG

The examples show that heavy Objects can be placed to the right of the prepositional argument while light Objects cannot. This is a non-transparent feature of Modern Hebrew.

5 The Morphosyntactic Level

Opacity is not only created by asymmetric mapping between levels, it can also be introduced within levels, when material is inserted at that level which has no counterpart at higher levels. This section discusses opacity introduced at the Morphological Level. The transparent features that will be considered are no expletives, no tense-copying, no raising, no grammatical gender, no declination, no conjugation, no agreement, and no fusional morphology.

5.1 No expletive elements

When a language has expletive elements, these are inserted at the Morphosyntactic Level into an obligatory clausal slot (Hengeveld and Mackenzie 2008: 347). Since expletive elements do not correspond to any material at the higher levels, they are considered to be a source of opacity. Modern Hebrew employs different expletive elements, of which *ze* ‘this/it’ and *yesh* ‘there is/are’ will be briefly discussed here.

Though Modern Hebrew has different expletive elements, their use is not obligatory in all contexts. The following example shows that Modern Hebrew sometimes allows the subject slot to remain empty, yielding a transparent relation between the Morphosyntactic Level and higher levels of grammar (Glinert 2004: 66):

- (36) (Ze) tov po.
 (it) good here
 ‘It is fine here.’

When the dummy subject in (36) is realized, the relation between the Morphosyntactic Level and the higher levels of grammar is rendered non-transparent. It has to be noted, though, that the use of a dummy subject *ze* as in (36) is characteristic of casual speech and not of the formal register (Glinert 2004: 63).

However, in some contexts the expletive element is not optional but instead obligatory, as in the following example with an expletive existential element (Coffin and Bolozky 2005: 323):

- (37) Yesh brexa ba-shxuna.
 EXIST pool in.DEF-neighborhood
 ‘There is a swimming pool in the neighborhood.’

At the Interpersonal Level, this sentence consists of a Referential Subact without any Ascriptive Subact. The element *yesh* ‘there is/are’ is inserted in the Morphosyntactic Level as if an Ascriptive Subact were mapped onto that slot, but in fact there is no such Subact.

Example (36) indicates that Modern Hebrew can be transparent in a context where some languages, such as English, would require a dummy element. Nevertheless, the obligatory use of the existential particle in (37) indicates that Modern Hebrew is not fully transparent in this area.

5.2 *No tense-copying*

In a transparent language, the tense of the verb in the subordinate clause is not dependent on the tense of the verb in the main clause. A language that copies the tense of the main clause to the subordinate clause, which is called tense-copying or sequence of tenses, is opaque. The tense operator of the main clause is copied to the subordinate clause at the Morphosyntactic Level (see Hengeveld and Mackenzie 2008: 367–368). A typical environment for tense-copying to occur in is indirect speech. In a transparent language, the tense of indirect speech is the tense used by the original speaker, whereas an opaque language copies the tense of the main clause to the quoted speech.

Modern Hebrew does not exhibit tense-copying. The tense used by the original speaker is maintained in indirect speech (Coffin and Bolozky 2005: 374). The following example of an indirect speech report contains two verbs

with different tenses, thus ruling out the possibility that tense-copying has taken place (Coffin and Bolozky 2005: 375):

- (38) Xavr-ey ha-kneset **amru** she-lo
 member-PL.CS DEF-parliament **say.PST.3.PL** COMP-not

yeshanu et hatsbaat-am.
change.FUT.3.PL OBJ voting-3.M.PL
 ‘The parliament members said that they would not change their vote.’

In (38) the verb in the main clause *amru* ‘they said’ has the past tense form, while the verb in the subordinate clause *yeshanu* ‘they will change’ has the future tense form.

We may conclude that with respect to tense-copying, Modern Hebrew is a transparent language.

5.3 *No raising*

When a constituent that semantically belongs to the subordinate clause pops up in the main clause, we say that the constituent has been ‘raised’ (Hengeveld and Mackenzie 2008: 368). Raising is non-transparent because it divides at the Morphosyntactic Level what belongs together at higher levels of grammar.

A common example of raising is the transfer of a Subject from the complement clause to the main clause. Modern Hebrew allows this type of raising, as the following example shows (Glinert 2004: 330):

- (39) **Yosef** alul lenatseax.
Yosef likely win.INF
 ‘Yosef is likely to win.’

Without raising, (39) would look as follows (Glinert 2004: 331):

- (40) Alul she-**yosef** yenatseax.
 likely COMP-**Yosef** win.FUT.3.M.S
 ‘It is likely that Yosef will win.’

The Subject of the complement clause in (40), *Yosef*, is raised to the main clause in (39). Allowing raising is an opaque feature of Modern Hebrew.

5.4 No grammatical gender, declination, conjugation

We speak of a gender system when a language assigns nouns into classes which trigger agreement in syntactically related words. In other words, grammatical gender is an abstract feature of the noun that is available to other heads. When the gender of a noun becomes visible on another head, we speak of gender agreement. Corbett (1991) distinguishes three types of gender systems: strict semantic systems in which only semantic criteria for gender assignment can be detected, predominantly semantic systems in which not only semantic but also formal assignment rules can be found and finally formal systems in which formal assignment criteria predominate. Not only the lack of a gender system, but also the presence of a strictly semantic system should be considered transparent. Corbett (1991: 8) stresses that even the most formal system has a semantic core. If this is correct, then fully opaque gender systems do not occur, while fully transparent systems do occur.

Modern Hebrew possesses a two-way gender system: nouns are either assigned to the feminine or to the masculine gender. Compare the following examples of a feminine and a masculine noun with agreeing adjective:

(41) *yald-a xamud-a*
 girl-SG sweet-F.SG
 ‘a sweet girl’

(42) *yeled xamud*
 boy.SG sweet.M.SG
 ‘a sweet boy’

Notice that in adjectives, like *xamuda* ‘sweet(F.SG)’ in (41), number and gender agreement is fused into a single undividable suffix. Masculine singular agreement as in (42) is characterized by the lack of a suffix.

For nouns such as *yeled* ‘boy’ and *yalda* ‘girl’ that refer to animates, gender assignment is transparent: biological females belong to the feminine gender and biological males belong to the masculine gender. The assignment of nouns that refer to inanimates, on the other hand, seems to be arbitrary with regard to semantics. There are some formal cues for the gender of inanimate nouns, but these are tendencies rather than strict rules. We have to conclude that Modern Hebrew is opaque with respect to grammatical gender: it possesses a gender system and this gender system is not strictly semantic.

Another type of noun classification is declension. Nouns that belong to the same declension class have the same form when inflected for grammatical categories such as case and number. Modern Hebrew does not possess

declension classes. What Modern Hebrew does exhibit, are conjugation classes. Based on their form, all verbs belong to one of the seven or eight verb classes, called *binyanim* ‘constructions’.⁶ Correlations exist between verb class and verb meaning, but these are tendencies rather than strict rules. The verb class *nifal*, for instance, is associated with passive voice, but not all verbs belonging to this class carry a passive meaning. The verb *nidras* ‘he/it was run over’ in sentence (22) above is indeed a passive verb, but the verb *nixnas* ‘he entered’ in the following sentence has a clear active meaning:

- (43) Ha-yeled **nixnas** la-xeder.
 DEF-boy **enter.PST.3.M.SG** to.DEF-room
 ‘The boy entered the room.’

To summarize, Modern Hebrew is transparent in that it possesses no declension classes, and opaque in that it exhibits gender and conjugation classes.

5.5 No agreement

Agreement is considered opaque since it allows a single feature to be expressed more than once at the Morphosyntactic Level. Modern Hebrew is a language with rich inflection and agreement⁷ may be expressed on many types of words: demonstratives, adjectives, free and bound pronouns, verbs, nouns, and numerals. Depending on the type of agreeing word, the following features are copied from the head: person, number, gender, and definiteness. These are examples of NPs in which demonstratives and adjectives agree with their nominal head:

- (44) Ha-yald-a ha-xamud-a hazot
 DEF-girl-SG DEF-sweet-F.SG this.F.SG
 ‘this sweet girl’

⁶ In descriptions of Modern Hebrew grammar, these verb classes are called *paal*, *piel*, *hifil*, *hitpaal*, *hufal*, *pual*, *nifal*, and *shafel*. The last class is often left out because it is small and unproductive. The name of the verb class consists of the tri-consonantal root *p-‘-l* plus the vowel pattern and affixes that characterize that specific class.

⁷ FDG distinguishes between argument agreement and operator agreement (Hengeveld and Mackenzie 2008: 350). This section concerns argument agreement. An example of operator agreement, tense-copying, is discussed in Section 5.2.

- (45) Ha-yeled ha-xamud haze
 DEF-boy.sg DEF-sweet.M.SG this.M.SG
 ‘this sweet boy’

Agreement is an opaque feature of Modern Hebrew.

5.6 *No fusional morphology*

Fusional morphology is considered opaque because there is no one-to-one relation between units of form and units of meaning when fusion has taken place (Hengeveld and Mackenzie 2008: 301). Hengeveld (2011: 19) distinguishes two types of fusion: stem alternation and cumulation. The first type, stem alternation, occurs when a stem changes its form according to its morphological context, i.e. the stem consists of multiple allomorphs. The second type, cumulation, combines multiple grammatical features into a single undividable morpheme, a so-called portmanteau morpheme.

Modern Hebrew is rich in fusional morphology of both types. Stem alternation, for example, often occurs between singular and plural forms of nouns:

- (46) **gever**
 man

- (47) **gvar-im**
 man-PL
 ‘men’

In (46) the stem is /gever/, while the stem of the plural *gvarim* ‘men’ in (47) is /gvar/.

As has been mentioned in the preceding section, Modern Hebrew shows cumulation. An example is combined number-gender marking on adjectives:

- (48) yald-a xamud-**a**
 girl-SG sweet-F.SG
 ‘a sweet girl’

- (49) ylad-ot xamud-**ot**
 girl-PL sweet-F.PL
 ‘a sweet girl’

- (50) ylad-im xamud-**im**
 boy-PL sweet-M.SG
 ‘a sweet boy’

The grammatical features number and gender are always fused together into a single morpheme on the adjective, it is impossible to tell where gender marking stops and where number marking begins in the number-gender markers /a/, /ot/, and /im/ in the examples above.

Modern Hebrew exhibits rich fusional morphology; this is an opaque feature of the language.

6 The Phonological Level

A transparent language shows no phonological adaptation, because phonological rules obscure the one-to-one relationship between the Phonological Level and higher levels in the Grammatical Component. Phonological adaptation entails adding elements or features that have no counterpart at higher levels, deleting elements or features that are handed down from higher levels, or swapping elements around. Phonological rules are hence a source of opacity. Examples of phonological adaptation are voicing, devoicing, vowel harmony, insertion, deletion, nasalization, degemination, and metathesis.

Modern Hebrew exhibits different types of phonological adaptation. I will here provide examples of metathesis and consonant voicing. Metathesis is applied when a root starting with a sibilant is used in the so-called *hitpa'el* verb class (verb classes are discussed above in Section 5.4). The third person masculine singular past form of the *hitpa'el* paradigm is formed by prefixing the element *hit-* and transfixing the vowel pattern *a-e* to the root. Take for example the verb *hitlabesh* ‘he got dressed’. This verb consists of the root *l-b-sh*, transfix *a-e* and prefix *hit-*. When a root starts with a sibilant (*s*, *sh*, *z*, or *ts*), the first consonant of the root swaps places with the final consonant of the prefix *hit-* (Coffin and Bolozky 2005: 98). When for instance the root *sh-l-m* appears in the *hitpa'el* verb class, it takes on the following form:

- (51) hishtalem
 be.worthwhile.PST.3.M.SG
 ‘(it) was worthwhile’

Not applying metathesis leads to an ungrammatical verb form:

(52) *hitshalem

The same verb class also provides an example of consonant devoicing. When the root starts with a voiced sibilant (z), two phonological operations take place. Not only does the final consonant of the prefix *hit-* and the first consonant of the root swap places, but the feature ‘voiced’ is also copied from the first consonant of the root to the final consonant of the prefix. Take, for example, the root *z-k-n*:

(53) *hizdaken*
 become.old.PST.3.M.SG
 ‘(he) grew old’

In (53) the /z/ of the root has switched places with the /t/ of the prefix *hit-* that changed into its voiced counterpart /d/.

Modern Hebrew shows different types of phonological adaptation and is in that respect non-transparent.

7 Degree of transparency

How transparent or opaque is Modern Hebrew compared to other languages? The transparency test designed by Hengeveld (2011a) to which Modern Hebrew has been subjected in this article, has also been applied to Dutch (Hengeveld 2011b), Quechua (Grández Ávila 2011), Kharia (Leufkens 2011), Sri Lanka Malay (Nordhoff 2011), and Esperanto (Jansen 2011). As I mentioned in the introduction, the outcomes for Esperanto deviate from the distribution of transparent features in the other languages, due to the fact that syntactic transparency was neglected when the language was designed. I will therefore exclude the Esperanto data from the discussion of transparent features in this section.

When the Hebrew data is added to the results of the transparency test as presented in Hengeveld (2011b), and the languages are put in order of ascending transparency, we arrive at the overview presented in Table 1⁸:

⁸ This overview is an expansion of Table 1 from Hengeveld (2011b: 111).

Table 1: Overview results of the transparency test for Dutch, Hebrew, Quechua, Kharia, and Sri Lankan Malay (SL Malay).

Transparent feature	Dutch	Hebrew	Quechua	Kharia	SL Malay
No apposition	–	–	–	–	–
No grammatical relations	–	–	–	–	+
No discontinuity	–	–	–	+	+
No sensitivity for nature of input	–	–	–	+	+
Phonological = Morphosyntactic phrasing	–	–	–	–	+
No influence of phonological weight	–	–	–	–	–
No expletive elements	–	–	+	+	+
No tense-copying	–	+	+	+	+
No raising	–	–	–	+	+
No grammatical gender	–	–	+	+	+
No agreement	–	–	+	+	+
No stem alternation	–	–	–	+	+
No cumulation	–	–	–	–	–
No phonological adaptation	–	–	–	–	–

The languages show zero, one, four, eight, ten, and eleven transparent features respectively on the list of features presented in Table 1. Modern Hebrew exhibits one transparent feature and therefore takes a position between Dutch, which shows no transparent features, and Quechua, which shows four transparent features.

The features in Table 1 are listed in the order in which they have been discussed in this paper. Notice, however, that the presentation of results in Table 1 differs from the discussion of transparent features in this paper with respect to the following four points: (1) cross-reference is included under apposition, (2) ‘no limitations on which semantic units can be chosen as predicates’ does not appear on the list⁹, (3) ‘no declination’ and ‘no conjugation’ do not appear on the list, (4) ‘no fusional morphology’ appears on the list as two separate features, namely ‘no stem alternation’ and ‘no cumulation’. This is the way the results of the transparency test are presented in Hengeveld (2011b) and I have

⁹ The reason for excluding this transparent feature is that some languages, such as Hebrew (Section 2.3), employ copulas. Hebrew has no limitations on which semantic units can be used as predicates and is in that respect transparent, but at the same time the language requires the use of copulas in certain contexts and this is an opaque feature. In other words, copulas complicate matters as they are themselves an opaque feature.

decided to adopt the same presentation in order to facilitate the comparison between Hebrew, Dutch, Quechua, Kharia, and Sri Lankan Malay.

In Table 1, languages are ordered according to their degree of opacity, i.e. according to the number of transparent features that they exhibit. The language on the left end of Table 1, Dutch, shows the highest level of opacity, and the language on the right end, Sri Lankan Malay, is the least opaque language in the sample. It appears, however, that we can go further than only ordering languages; we can also put the transparent features in a logical order. What I mean is that when languages exhibit a collection of transparent features, the distribution of these features seems far from random. Indeed, the discussion of the distribution of transparent features in Hengeveld (2011b) shows that features can be ordered according to the strength of their resistance to opacity. This means that a feature with a high resistance to opacity can be found even in relatively opaque languages. A feature with a low resistance to opacity, on the other hand, may be absent even from relatively transparent languages. I will refer to the ordering of features according to their strength of resistance to opacity as the Opacity Resistance hierarchy. The following hierarchy can be extracted from the results of the transparency test (compare Table 2 in Hengeveld 2011b: 112):

Table 2: Opacity Resistance hierarchy based on Hengeveld (2011b) and results presented in the current article.

Transparent feature	high
No tense-copying	Opacity Resistance low
No expletive elements	
No grammatical gender	
No agreement	
No discontinuity	
No sensitivity for nature of input	
No raising	
No stem alternation	
No grammatical relations	
Phonological = Morphosyntactic phrasing	
No apposition	
No influence of phonological weight	
No cumulation	
No phonological adaptation	

It has to be stressed that the ordering in Table 2 is based on the surveys of just five languages, namely Dutch, Quechua, Kharia, Sri Lanka Malay, and Hebrew, and is therefore tentative in nature.

The prediction that follows from the Opacity Resistance hierarchy is that the lower a feature stands in Table 2, the more languages will lack it, i.e. the less resistant it is to opacity. This means that even relatively transparent languages may lack such features. An example is Sri Lanka Malay, which lacks the four transparent features in the lowest box but is transparent with respect to all higher features (Hengeveld 2011b: 112). Reversely, the hierarchy predicts that the higher a feature stands in Table 2, the more languages will adhere to it, i.e. the more resistant it is to opacity. This means that we expect even relatively opaque languages to adhere to the highest features. Modern Hebrew confirms this prediction: the only transparent feature it adheres to, ‘no tense-copying’, is exhibited by all languages in Table 1 but Dutch, the most opaque language of the sample. The fact that tense-copying is the only transparent feature in Hebrew suggests that it possesses the highest resistance to opacity of all features. This information is new: based on the data of Dutch, Quechua, Kharia, and Sri Lanka Malay, no difference in strength of resistance to opacity of the four highest features in Table 2 could be established (compare Table 2 in Hengeveld 2011b: 112). This shows how the Opacity Hierarchy can be fine-tuned by adding more languages to the sample and subjecting them to the transparency test.

8 Conclusion

The main purpose of the present article was to answer the question how transparent Modern Hebrew is. The language appears to be highly opaque. Of all the transparent features that have been discussed in the preceding section, Modern Hebrew adheres only to ‘no tense-copying’. With respect to degree of transparency, Modern Hebrew takes a position between the extremely opaque Dutch and the moderately opaque Quechua, which exhibits four of the transparent features that have been discussed in the preceding section.

The second purpose of this article was to answer the question whether the distribution of transparent characteristics of Modern Hebrew aligns with the distribution found in Dutch, Quechua, Kharia, and Sri Lanka Malay or that it deviates like Esperanto does. I have shown that the outcome of the transparency test for Modern Hebrew aligns with the results for the first four languages. The only full transparent feature of Modern Hebrew is ‘no tense-copying’. This suggests that ‘no tense-copying’ is in fact the most resistant of all the features included in the test.

The scale of transparent features proposed by Hengeveld (2011b: 112) and its reformulation as the Opacity Hierarchy in the present article are both tentative in nature. Further research is needed in order to discover whether such a hierarchy can be maintained when more languages are subjected to the test. If the hierarchy indeed continues to stand firm, then further language data may enable us to fine-tune it. It will also be interesting to see whether data from other languages will confirm that the lack of tense-copying is the most resistant of all features as the Modern Hebrew data suggest.

Abbreviations

1	first person	FUT	future
2	second person	INF	infinitive
3	third person	M	masculine
COMP	complementizer	NP	Noun Phrase
COP	copula	OBJ	object marker
CS	construct state	PASS	passive
DEF	definite article	PL	plural
EXIST	existential	PRS	present
F	feminine	PST	past
FDG	Functional Discourse Grammar	SG	singular

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Mijke Mulder

mijke.mulder@gmail.com