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Syncretism in Modern Hebrew

M.A thesis submitted by

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ABSTRACT

In an ideal system, there is a one-to-one correspondence between function and form. When the system is an inflectional paradigm, every cell in a paradigm would have a unique exponent, corresponding to a unique bundle of morpho-syntactic feature values (phi-features). However, most, if not all natural languages deviate from this ideal system, where one type of deviation is syncretism.

Syncretism refers to cases where a single exponent serves two or more bundles of morpho-syntactic feature values in the paradigm.

Stump (2001) distinguishes between two types of syncretism – **directional syncretism** (which can be **unidirectional** or **bidirectional**) and **symmetrical** syncretism. **Directional syncretism** is where morpho-syntactic set of feature values of one form (the determinant) are extended to another form (the depended) and symmetrical syncretism, whereby there is no indication which of the values is the determinant and which is the dependent. (Baerman, Brown and Corbett 2005).

In this study I exam three cases of syncretism in the verbal system of MH; Person (developing syncretism)¹: 1 vs. 3, Tense: PAST vs. PRESENT and Person & Gender: 2.MS vs. 3.FM. I aim to determine the type of association for each case of syncretism in MH.

In this framework, I will also evaluate morphological theories of feature hierarchy and markedness relations in order to discover why one value prevails over the other.

I conducted four experiments. In three experiments, 36 junior-high students participated and in the fourth experiment, 33 junior-high students participated. In experiments 1,2 and 4 the participants receive a list of verbs (see Appendix A) and request to compose for each verb a

¹ The person syncretism is a recent development in MH; the *y-* prefix is the normative exponent of 3.MS.SG.FUT, but many speakers have used it also as the exponent of 1.SG.FUT.

sentence that includes one of the person pronouns in the subject position or one of the time markers: *etmól* ‘yesterday’, *ax[á]v* ‘now’, or *maxár* ‘tomorrow’, corresponding to Past, Present, or Future tense respectively.

In experiment 3, the participants receive sentences in different classes and different values of tense, person, gender and number and a sentence frame in the future, with the pronoun of first person *aní* ‘I’ and requested to fill in the frame with the same verb as the given sentence.

The findings show no symmetrical effects between the syncretic features values, however it is not always possible to determine directionality or the determinant feature or feature value.

Likewise, an attempt to answer whether directionality reflects any hierarchical markedness relationships was not always possible.

A very important conclusion that arises from this experiment is that all the participants, except in very few cases, saw in each of the syncretic forms only one feature value and no ambiguity of values, i.e., for each of the participants there is a more accessible feature value that identified with the verb form .

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1. Introduction

In an ideal system, there is a one-to-one correspondence between function and form. When the system is an inflectional paradigm, every cell in a paradigm would have a unique exponent, corresponding to a unique bundle of morpho-syntactic feature values (phi-features). However, most, if not all natural languages deviate from this ideal system, where one type of deviation known as *syncretism*.

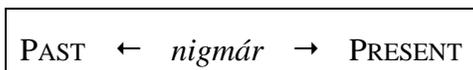
Syncretism refers to cases where a single exponent serves two or more bundles of morpho-syntactic feature values in the paradigm, i.e. when the morpho-syntax of a language makes a particular distinction, but the morphology does not (Baerman, Brown, and Corbett 2005). For instance, the first and the third MS forms in Somali have the same exponent, and so do the second and the third FM forms (Kirk 1905). This syncretism holds for the singular but not the plural paradigm.

(1) Person syncretism in Somali

		Indicative Aorist	Indicative Preterite
		<i>'I tell'</i>	<i>'I told'</i>
SG	1	shèg-a	shèg-ei
	2	sheg-ta	sheg-tei
	3 MS	shèg-a	shèg-ei
	3 FM	sheg-ta	sheg-tei
PL	1	sheg-na	sheg-nei
	2	sheg-tan	sheg-ten
	3	shèg-an	shèg-en

A question often addressed in studies on syncretism concerns the nature of association between different sets of phi-feature values and the exponent. There are at least two competing types of associations – symmetrical and directional (Baerman, Brown and Corbett 2005):

- a. A form can be associated with two or more sets of phi-features values in a *symmetrical* manner. For example, *nigmár* could be associated symmetrically with both tenses, past and present.



- b. A form can be associated via *directional* rules, that entail a two-step association; For example, *nigmár* could be associated with one of the tense values (the *determinant*), say the past, and it is ‘borrowed’ by the other member of the tense values set (the *dependent*), in this case the present (Stump 2001).



In this study, I conducted four experiments, aiming to determine the type of association for each case of syncretism in MH; does the form associate with two sets of phi-features values in a symmetrical manner or does it associate via directional rules. The results I obtained from the experimental study allowed me to assess the way the syncretic verbs are processed, and to evaluate morphological theories of feature markedness relations.

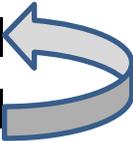
2. Syncretism

The term *syncretism* refers to a phenomenon in inflectional paradigms, where two or more cells within a paradigm have the same exponent. There are different ways in which cells in the paradigm united (see in particular Stump 2001 and Baerman, Brown and Corbett 2005), but here I elaborate only on those that are relevant to the MH verbal paradigm (see section 3), where at the center of the discussion stands the issue of directionality.

Stump (2001) distinguishes between two types of syncretism – *directional syncretism* (which can be *unidirectional* or *bidirectional*) and *symmetrical syncretism*. **Directional syncretism** is usually unidirectional whereby the morpho-syntactic set of feature values of one form spread to another form (Baerman, Brown and Corbett 2005).

(3) Directional syncretism in Macedonian (Stump 1993)

<i>'padn'</i>	Present	Aorist	Imperfect
1 SG	padn-am	padn-a-v	padn-e-v
2 SG	padn-e-š	padn-a	padn-e-še
3 SG	padn-e	padn-a	padn-e-še
1 PL	padn-e-me	padn-a-v-me	padn-e-v-me
2 PL	padn-e-te	padn-a-v-te	padn-e-v-te
3 PL	padn-at	padn-a-a	padn-e-a



In the examples in (3), a rule of referral stipulates that the 2.SG in the Aorist and Imperfect takes the form of 3.SG, i.e. the 3.SG form is the determined and the 2.SG is the dependent. Stump (1993) assumes this directionality because the 3.SG in the Aorist and Imperfect is distinct by the absence of the element *-v-* in both the singular and the plural and this property is spread to the 2.SG. Likewise, under the Noyer (1998) theory, the third person is unmarked with respect person, and the unmarked usually overrides.

There are two types of syncretism within directional syncretism – unidirectional and bidirectional. In **unidirectional syncretism**, all forms sharing category X adopt the exponent of category Y and the directional effect seems to move in only one direction. For instance, in Hungarian the first person of the past tense the indefinite adopts the form of the definite. The *-k* marks the indefinite and *-m* the definite, but in the past *-m* marks both (Carstairs 1987).

(4) Unidirectional syncretism in Hungarian conjugation (Carstairs 1987)

'wait'	Present	Past
1SG INDF	va' r-o -k	va' r-t-a- m
1SG DEF	va' r-o- m	va' r-t-a- m

In *bidirectional syncretism*, some forms in category X adopt the exponent of category Y, and some forms in category Y adopt the exponent of category X. See the example from Latin below (Baerman, Brown and Corbett 2005).

(5) Bidirectional syncretism in Latin second declension

	Neuter 'war'	Masculine 'slave'	Accusative 'crowd'
NOM SG	bell- um	serv- us	vulg- us
ACC SG	bell- um	serv- um	vulg- us
GEN SG	bell- ī	serv-ī	vulg-ī
DAT SG	bell- ō	serv- ō	vulg-ō
ABL SG	bell- ō	serv- ō	vulg-ō

Against directional syncretism stands *symmetrical syncretism*, whereby there is no indication which of the values is the determinant and which is the dependent. The paradigm below includes three pairs of syncretic forms where directionality cannot be determined (Baerman, Brown and Corbett 2005, Stump 2001, Wunderlich 2004).

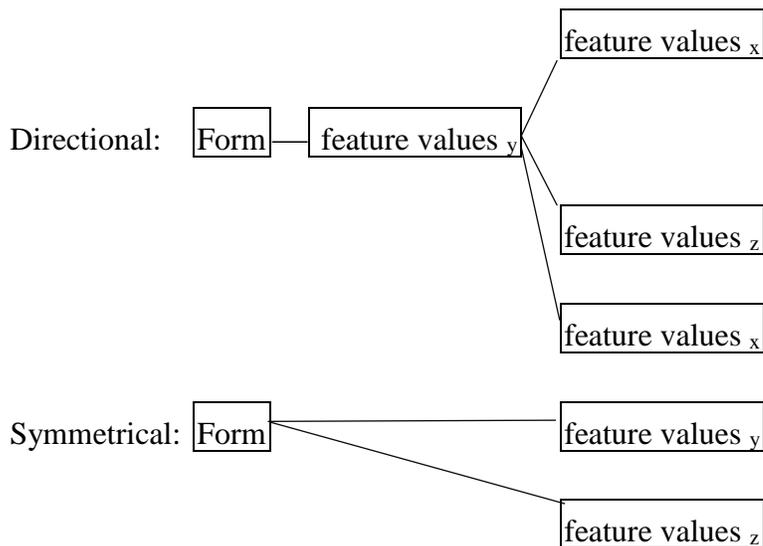
(6) Symmetrical syncretism in Simple perfect forms of Vedic

tud 'strike'		Singular	Dual	Plural
Active	1	tutód-a	tutud-á	tutud-má
	2	tutód-itha	tutud-áthur	tutud- á
	3	tutód-a	tutud-áthur	tutud-úr
Middle	1	tutud-é	tutud-váhe	tutud-máhe
	2	tutud-sé	tutud-áthe	tutud-dhvé
	3	tutud-é	tutud-áte	tutud-ré

We could postulate directionality here based on markedness (Noyer 1998), whereby plural is the determined in the plural-dual syncretism, and third person is the determined in the 3-1 person syncretism. However, there is no structural evidence supporting this or any other directionality.

To sum up, in symmetrical syncretism there is an exponent in the morpho-syntax which is directly associated with different functions, i.e. different sets of morpho-syntactic feature values, while directional syncretism entails a two-step association, where the exponent is associated with one function – the determinant, to which other functions refer – the dependents (Baerman, Brown and Corbett 2005).

(7) Directional (asymmetrical) and symmetrical syncretism



2.1. Directionality and feature values structure

Given directional syncretism, the question to ask is why does one value prevail over the other? Can we assume a hierarchy of markedness that will determine directionality? According to Baerman, Brown and Corbett (2005), there are two main types of feature structure: flat, where there is no markedness asymmetries, and hierarchical, where feature values are arranged in a hierarchy of markedness.

Stump (1993) and Carstairs-McCarthy (1998) assume a flat feature structure, where there is no markedness asymmetries, no predictions about the relative markedness of a directional syncretism and no dependent and determinant members. Support for this structure can be found in the existence of bidirectional syncretism (see §2.1) and cases of unidirectional syncretism in which the dependent is less marked than the determinant member.

On the other hand, Noyer (1997) and Harley and Ritter (2002) support a hierarchical structure, whereby feature values are arranged in a hierarchy of markedness such that wherever there is directional syncretism, the morphosyntactic property set of the determinant should be

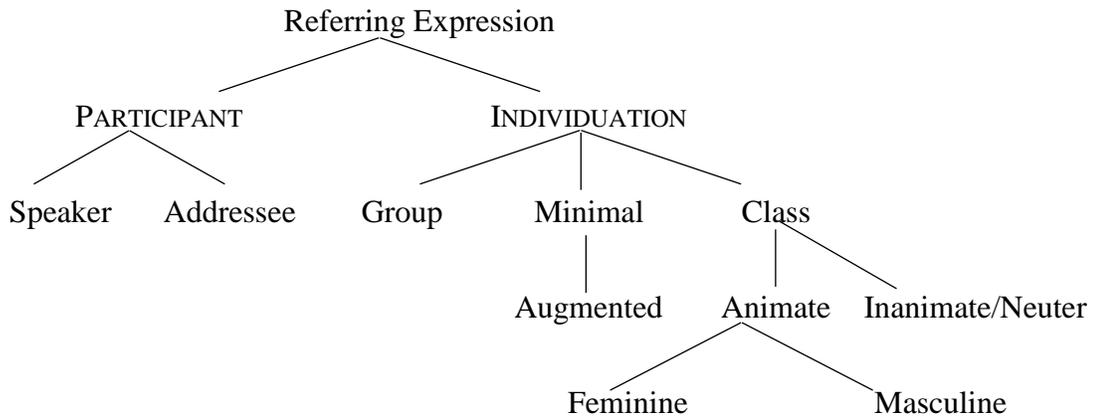
less marked than that of the dependent member. This theory has predictions with regard to the possible and impossible patterns of syncretism.

As Harley and Ritter (2002) note, Noyer (1992, 1997) attempts to provide a theoretical framework that predicts the existence of universal hierarchy of verbal features, as in Greenberg (1963). For example, “If there are any gender distinctions in the plural of the pronoun, there are some gender distinctions in the singular also” (Universal 45 in Greenberg 1963).

Harley (1994) and Harley and Ritter (2002) propose a morphosyntactic feature geometry in order to constrain pronoun and agreement systems. According to the morphological feature geometry theory of Harley and Ritter (2002), each feature (e.g. person, number and gender) constitutes an abstract category of internally organized values (e.g. singular, plural, masculine, feminine, first person, second person). Different languages define their particular morphological features by different parameters from a large feature inventory in accordance to its internal morphological structure and organization. Harley and Ritter assume that markedness is established in the geometry; any feature linked to a feature higher in the tree implies the presence of that higher feature in lexical items. For instance, the morphosyntactic feature geometry in (8) below shows that the feature animate entails that feature individuation is present because the feature animate is displayed as dependent on feature individuation. Feature individuation may not be eliminated from the geometry without also eliminating feature animate.

As in phonological feature geometries, Harley and Ritter (2002) treat nodes that receive a markedness interpretation as underspecified: there are no plus or minus feature values but rather nodes are identified as representing the default interpretation of a bare organizing node by being absent.

(8) Morphosyntactic feature geometry (Harley and Ritter 2002)



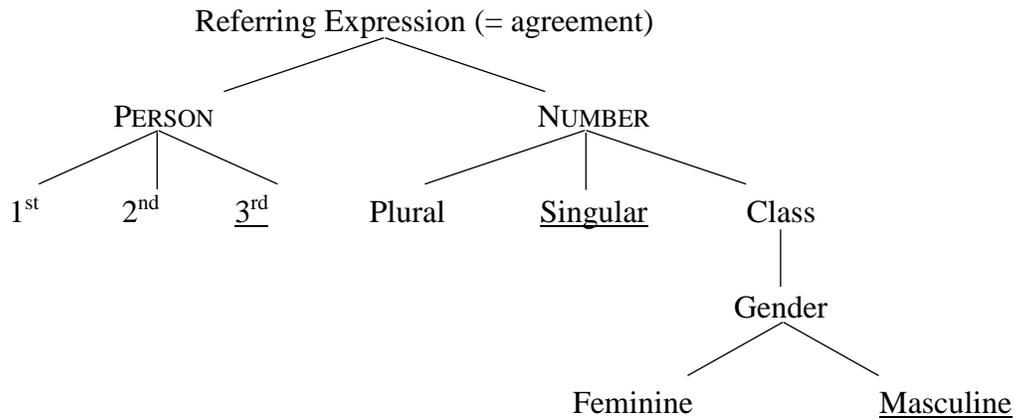
According to this approach, the behavior of directional effects should be predictable. For example, morphological generalizations show that languages treat third person differently from 1st (speaker) and 2nd (addressee). 3rd person agreement is often zero, while 1st & 2nd person agreement is overt and many languages have distinct first & second person pronouns only while for the third there is no person pronoun and they use demonstratives.

These morphological generalizations indicate that third person is unmarked relative to the other persons and where first or second person is syncretic with the third person, as in MH, the resulting syncretic form should be identifiable as third person rather than first or second. However, Baerman, Brown and Corbett (2005) argue, based on a large set of examples from different languages, that directional effects not always reflect a consistent hierarchy and therefore, cannot be generally predictable based on the values of the features involved.

Directionality instances can reflect diachronic changes, where the identifiable form for one value is the form that originally prevailed over another value form. According to this approach, there is no way to predict which values will provide the form, and which values will receive it.

In this study, I will assume Harley and Ritter (2002) morphosyntactic feature geometry, according to the features and the feature values in MH. This feature hierarchy will allow predicting which value overpowers other values.

(9) MH morphosyntactic feature geometry



3. Syncretism in Modern Hebrew

MH verbs are inflected for number and gender in the present tense (participle), and for number, gender and person in the past and future tenses (Schwarzwald 2002). The verbal paradigms display several cases of syncretism, in which a single form is associated with two different bundles of morpho-syntactic features. The present study concentrates on the features Tense with the values PAST, PRESENT and FUTURE; the feature Gender with the values MASCULINE and FEMININE; and the feature Person with the values 1st, 2nd, and 3rd.

3.1. Hebrew Tense syncretism – Past and Present

MH distinguishes three Tense values: PAST, PRESENT (participle) and FUTURE. The intersection of the three tense values and the two gender values can yield six distinct inflected forms in each verb class (binyan). However, as shown below, there is tense syncretism in all verbs in class B2 and in the monosyllabic verbs of B1.

(10) Tense syncretism in MH

Verb class:	B2 'enter'			B1 'run'		
	Past	Present	Future	Past	Present	Future
3.MS.SG	nixnas	nixnas	yikanes	rats̄	rats̄	yaruṯ̄
3.FM.SG	nixnesa	nixneset	tikanes	rats̄a	rats̄a	taruṯ̄

In (10) we see that Tense syncretism in MH occurs within the third person singular value of the feature Person, in two verb classes (binaynim) – all B2 verbs and the monosyllabic subclass of B1. In both classes, the syncretism occurs between the past and present values of tense.

However, while in B2 it is restricted to the masculine, in B1 it occurs in both the masculine and the feminine of monosyllabic verbs

Tense is inherent to the verb, in contrast with person, number and gender (agreement features) which encode information about the argument of the verb. According to Baerman, Brown and Corbett's (2005) typology of 30 languages, there is no language with tense (as well as aspect and mood) syncretism in its verbal paradigm that does not have syncretism of some agreement feature somewhere within the verbal morphology. Yet, they bring an example from the Tibeto-Burman language Limbu, where the past and non-past are syncretic in the second person singular subject and third person object of either number, but there is no syncretism of the agreement features, only syncretism of tense. This suggests that tense syncretism (aspect and mood) is not obligating an agreement syncretism within the same word.

In general, this syncretism is classified as *simple syncretism*, “where two or more cells with different values for a feature are merged” (Baerman, Brown and Corbett 2005:13). However, since this simple syncretism spread across B2 and B1, it is more accurate to classify it as *nested syncretism* (Baerman, Brown and Corbett 2005). *Nested syncretism* refers to cases where simple syncretism spread across different environments. Another example of nested syncretism is drawn from Upper Sorbian (a West Slavonic language), where a-stem nouns have

syncretism of the dative and locative in the singular, while all other nominals, as below, have and additional syncretism of the dative, locative and instrumental in the dual.

(11) Nested syncretism in Upper Sorbian (Baerman, Brown and Corbett 2005)

<i>'wife'</i>	Plural	Singular	Dual
NOMINATIVE	žony	žona	žonje
ACCUSATIVE	žony	žonu	žonje
GENITIVE	žonow	žony	žonow
DATIVE	žonnacham	žonje	žonomaj
LOCATIVE	žon	žonje	žonomaj
INSTRUMENTAL	žonami	žonu	žonomaj

3.2. Hebrew Combined Person and Gender syncretism- 2.MS and 3.FM

Until now, Syncretism presented as the merger of distinct values of a single category. However, MH displays syncretism that involves two features – person and gender (this particular syncretism is seen other Semitic languages). For this type of syncretism where the syncretic items occupy non-adjacent cells and more than one feature is involved I called *multiple feature syncretism*. This syncretism occurs in all the future tense forms of the 2.MS.SG and 3.FM.SG.

(12) 2nd MS.SG / 3rd FM.SG Future syncretism in MH

	V	II	I	IV	III
2.MS.SG	titkaʃeʔ	tipaʔed	tilmad	tedabeʔ	tasbiʔ
2.FM.SG	titkaʃki	tipaʔdi	tilmedi	tedabki	tasbiki
3.MS.SG	yitkaʃeʔ	yipaʔed	yilmad	yedabeʔ	yasbiʔ
3.FM.SG	titkaʃeʔ	tipaʔed	tilmad	tedabeʔ	tasbiʔ
	<i>'call'</i>	<i>'break up'</i>	<i>'learn'</i>	<i>'talk'</i>	<i>'explain'</i>

Multiple feature syncretism is the term I call to what Baerman, Brown & Corbett (2005) call *partial polarity*, and *mediated polarity*. Baerman, Brown & Corbett (2005) distinguish three types of what they call Polarity effects: *full polarity*, *partial polarity*, and *mediated polarity*.

Full polarity is a perfect mirror-image identity of noncontiguous paradigmatic cells as can be seen below in Somali. Determiners, which are suffixed to nouns, have two distinct forms (13): broadly speaking, those in *ka* attach to nouns, which are masculine singular, or feminine plural, while those in *ta* attach to nouns that are feminine singular or masculine plural (class 3 and 4, where nouns take *ka* for both numbers, are exceptions).

(13) Full polarity in Somali definite article (Baerman, Brown and Corbett 2005)

	Singular	Plural
FM	-ta	-ka
MS	-ka	-ta

Partial and mediated polarity refers to cases where the syncretic items occupies non-adjacent cells and that more than one feature is involved, therefore, it seems more accurate to call partial polarity and mediated polarity syncretism - *multiple feature syncretism*.

An example for this kind of syncretism appear in the Old Irish paradigm. The form *fir* appears in both the singular and plural, but within the case paradigm the form *fir*, in both the singular and plural is not syncretic: in the singular, it serves as the genitive and in the plural; it serves as the nominative (14).

(14) Multiple feature Syncretism in Old Irish (Baerman, Brown and Corbett 2005)

'man'	Singular	Plural	Dual
NOMINATIVE	Fer	Fir	Fer
ACCUSATIVE	Fer	Firu	Fer
GENITIVE	Fir	Fer	Fer

3.3. Hebrew Person syncretism – 1st and 3rd

MH displays a currently developing syncretism in the future tense between the first person (MS/FM) singular and the third person masculine singular. Historically (as reflected in the orthography), these two categories are distinct, but for many speakers today the two functions share the form of the third person.

(15) 1/3 person syncretism in MH

		V	II	I	IV	III
Old	1.SG	etkafeʔ	epaʔed	elmad	adabeʔ	asbiʔ
Old	3.MS.SG	yitkafeʔ	yipaʔed	yilmad	yedabeʔ	yasbiʔ
New	1.SG					
		<i>'connect'</i>	<i>'separate'</i>	<i>'study'</i>	<i>'talk'</i>	<i>'explain'</i>

In this developing syncretism, we find *simple syncretism*. Another example for simple syncretism appear in Central Alaskan Yup'ik, where the absolutive and relative cases have the same form, in both the plural and dual.

(16) Simple syncretism in Central Alaskan Yup'ik (Baerman, Brown and Corbett 2005)

<i>'land'</i>	Singular	Dual	Plural
ABSOLUTIVE	nuna	nunak	nunat
RELATIVE	nunam	nunak	nunat
LOCATIVE	nunami	nunagni	nunani
ABLATIVE	nunamek	nunagnek	nunaneK
ALLATIVE	nunamun	nunagnun	nunanun
PERLATIVE	nunakun	nunagnengun	nunatgun
COMPARATIVE	nunatun	nunagtun	nunacetun

4. The study

4.1. Research questions

The questions the experiments aim to answer are as follows:

- a. What is the type of relation holding between syncretic forms within each paradigm in MH? Is it directional or symmetrical?
- b. What can we learn from the relations obtained in question (a) about the organization of morphological features? For question (b), I will also evaluate Harley and Ritter's (2002) morphological hierarchy and typological implicational relations. (See section 2.1)

4.2. The experiments

In this study I conducted four experiments (see Appendix A):

- a. **Experiment 1** examined Tense syncretism in B1 and B2, where past and present (participle) share an exponent.
- b. **Experiment 2** examined the two cases of person syncretism:
 - i. The Combined Person & Gender syncretism – 2.MS and 3.FM, ; and
 - ii. The currently developing Person Syncretism – 1.SG and 3.MS.SG (I combined the two cases of syncretism in order to reduce the number of distractors).
- c. **Experiment 3** examined only the currently developing Person syncretism – 1.SG and 3.MS.SG.
- d. **Experiment 4** examined Tense syncretism – Past and Present (participle) controlled for telicity (see Appendix B).

4.3. Participants

Thirty-six junior-high students (18 males and 18 females) participated in Experiments 1-3. They were monolingual, native speakers of MH at the average age of 15 years. A different set of 33 junior-high students (13 males and 20 females) participated in Experiment 4. They were monolingual, native speakers of MH at the average age of 15 years. All the participants had no personal history of developmental speech and hearing, language, or reading disorders that can affect the experiment.

4.4. Materials and procedure

The tasks in all the experiments involved reading and writing in a classroom setting. Before the beginning of each experiment, the participants receive two examples and written instructions on the requests of the experiment. The first three experiments handed in two versions, each with randomly ordered items.

Experiment 1 – Tense <3.MS/FM.SG.PAST–MS/FM.SG.PRES>: The experiment contains forty-three verbs (see Appendix A). Twenty-four are the tested verbs when twelve verbs belong to the syncretism in the sub-class of B1 (e.g. *kam* ‘he got up’ / ‘he is getting up’), and twelve verbs belong to the syncretism in class B2 (e.g. *nilmad* ‘was learned’ / ‘is being learned’). The nineteen remaining verbs are distractors of all types of classes and contain all kinds of stems, genders, numbers, persons and tenses (e.g. *medabeκ* ‘he is taking’).

The participants receive a list of verbs and request to compose for each verb a sentence that includes one of the time markers: *etmól* ‘yesterday’, *ax]áv* ‘now’, or *maxár* ‘tomorrow’, corresponding to Past, Present, or Future tense respectively. For example:

- (17) Given verb: *kam* ‘he got up / he gets up’
 Possible answers: a. *etmól hu kam mukdam* ‘yesterday he got up early’
 b. *ax]áv hu kam levad* ‘now he gets up alone’

Experiment 2 – Person&Gender <2.MS.SG.FUT – 3.FM.SG.FUT> and **Person** <1.SG.FUT – 3.MS.SG.FUT>: The experiment contains forty-three verbs (see Appendix A). Twenty-four are tested verbs; twelve verbs belong to the tested group of second MS.SG – third FM.SG person syncretism (e.g. *tilmad* ‘she will learn / you sg. will learn’) and the other twelve verbs belong to the 1st – 3rd person syncretism (e.g. *yitkafek* ‘I/he will call’). The nineteen remaining verbs are distractors in all types of classes and contain all kind of stems, genders, numbers, persons and tenses (e.g. *hifxid* ‘he scared’).

The participants receive a list of verbs (different from the list in Experiment 1) and were asked to compose for each of the verbs a sentence that includes one of the person pronouns in subject position.

(18) Given verb: *tirkod* ‘she / you MS.SG will dance’

Possible answers: a. *hi tirkod kol alaila* ‘she will dance all night’

b. *ata tirkod kol alaila* ‘you MS.SG will dance all night’

Experiment 3 – Person <1.SG.FUT – 3.MS.SG.FUT>: The experiment contains 17 verbs; 10 of the verbs belong to the tested group, which tests syncretism between the first SG and the third SG.MS in the future tense. The remaining seven verbs are distractors from different classes and different morpho-syntactic features values of tense, gender and number (see Appendix A).

The participants receive sentences in different classes and different values of tense, person, gender and number and a sentence frame in the future, with the pronoun of first person *ani* ‘I’.

(19) Given sentence: *hu patax et hamatana* ‘he opened the present’

Given frame: *maxar ani _____ et hamatana* ‘Tomorrow I’ll _____ the present’

The participants requested to fill in the frame with the same verb as the given sentence.

Experiment 4 – Tense <3.MS/FM.SG.PAST–MS/FM.SG.PRES>: In this experiment, the verbs sorted according to their telicity⁵ in order to examine whether the tense choice is an effect of the natural endpoint of the verb for both verb classes.

The analysis of the verbs to telic and atelic was done by test of the ability of adding the words ‘*within*’ and ‘*during*’ to each of the verbs (Hay et al 1999).

The experiment contains fifty-nine verbs (see Appendix B). Thirty-eight are tested verbs (nineteen telic and nineteen atelic): twenty-two syncretic verbs in the sub-class of B1 – ten

⁵ Telic verb is a verb that presents an action or event that has an endpoint. i.e., an action or event that being completed and therefore, in this type of verbs I predict a preference for past tense.

Atelic verb is a verb that presents an action or event that does not has an endpoint. i.e., an action or event that has not completed and therefore, in this type of verbs I predict a preference for present tense.

masculine (e.g. *kam* ‘he got up / he is getting up’) and twelve feminine (e.g. *kama* ‘she got up / she is getting up’); and sixteen syncretic verbs in class B2 (e.g. *nixnas* ‘entered/ ‘is entering’). The twenty-one remaining verbs were distractors of all types of classes and contain all kind of stems, genders, numbers, persons and tenses (e.g. *medabek* ‘he is taking’)

The participants receive a list of verbs and were asked to compose for each verb a sentence that includes one of the time markers: *etmól* ‘yesterday’, *ax[áv* ‘now’, or *maxár* ‘tomorrow’, corresponding to Past, Present, or Future tense respectively. For example:

- (20) Given verb: *kam* ‘to get up’
- Possible answer: *etmól hu kam mukdam* ‘Yesterday he got up early’

4.5. Hypotheses

The experiments have different possible results, which will lead to different conclusions. In this section, I will introduce the possible scenarios.

- a. **Chance** preference in any of the experiments for both values of the syncretic form would suggest **symmetrical** relation, where the syncretic form is directly associated with both sets of feature values (see § 2)

Chance preference in Experiment #1 (Tense <past present>) may also indicate that the participants attend to the feature Telicity (telic/atelic) and not Tense, and thus will identify *kam* ‘to get up’ as past, but *[ar* ‘to sing’ and present. This requires another experiment, which controls for Telicity.

- b. **Significant** preference in any of the experiments for one feature value in a syncretic form (2nd MS/3rd FM, past/present, 1st/ 3rd) would support **directional** syncretism, where the selected value is the determinant to which the other value refers.
- c. We expect participants to identify the correct person in Experiment 2, where they are given 3rd.MS.SG.FUT verbs (among other verb forms), but are required to use this same form for the

1st person in Experiment 3, where they are asked to convert a given verb to 1st.SG.FUT. This may indicate a distinction between word recognition (Experiment 2) and word retrieval from lexical storage.

- d. As for the Person & Gender syncretism in Experiment 2, there is an unmarked value in each feature bundle: MS gender in 2.MS.SG and third person in 3.FM.SG. We predict that if there were a determinant, it would be 2.MS.SG because of the paradigm of the 2.MS.SG (Stump 1993).

5. Results and Discussion

The following tables and bar charts summarize the results of all the cases of syncretism that examined in this study. Each table presents the total of the morpho-syntactic features values chosen by the participants for the total verbs forms (see Appendix C and D for the full list of verbs, Appendix E and G for the results for each verb and Appendix G and H for each of the participants). The column titled ‘disqualified’ represents cases that were not relevant for the study (see Appendix I). The column titled ‘ambiguity’ represents cases where the participants noted there is more than one time or person marker that agrees with the verb forms. In the bottom of each table, there is the p value (it is red when it is statistically significant). At the framework of the statistical analysis, I assumed an equal percentage for each pair of variables.

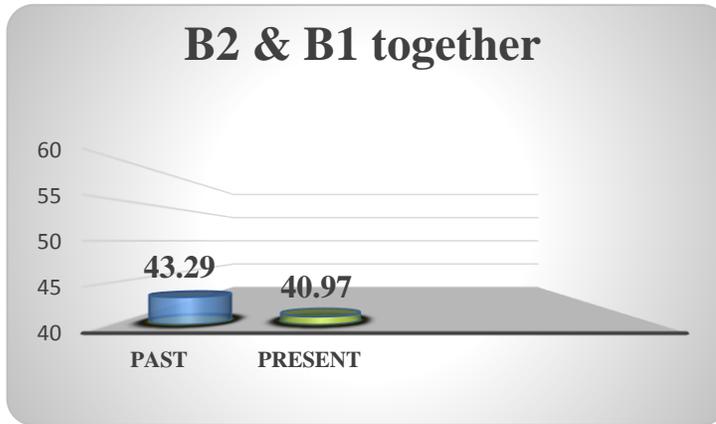
5.1. Tense syncretism

5.1.1. Experiment #1

The results in (21) show that there is no significant preference for one tense over the other when both verb classes, B1 and B2 are together.

(21) Past and Present tense syncretism: B2 & B1 together

Past	Present	Future	Disqualified	Ambiguity
374/864	354/864	39/864	94/864	3/864
43.29%	40.97%	4.51%	10.88%	0.35%
p=0.78				



However, a closer look at each verb class independently reveals an important difference between the two.

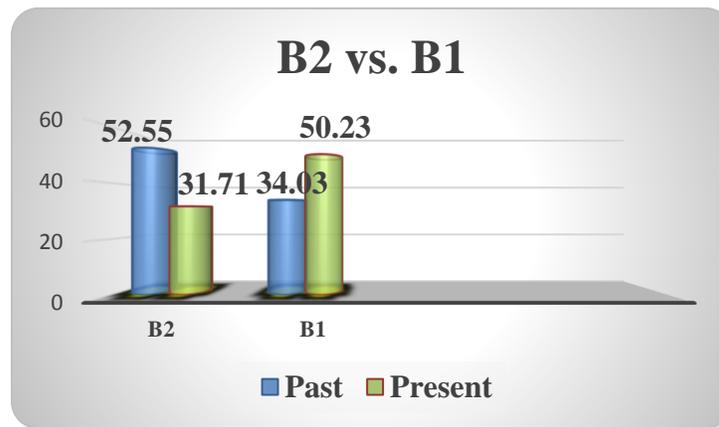
(22) Past and Present tense syncretism: B2 vs. B1

a. B2

Past	Present	Future	Disqualified	Ambiguity
227/432	137/432	12/432	55/432	1/432
52.55%	31.71%	2.78%	12.73%	0.23%
p=0.07				

b. B1

Past	Present	Future	Disqualified	Ambiguity
147/432	217/432	27/432	39/432	2/432
34.03%	50.23%	6.25%	9.03%	0.46%
p=0.07				



The results of each verb class independently reveal a contrastive behavior, though not significantly different. In B2 (22a), there is a trend towards past tense, as the participants identified the syncretic forms as past tense (52.55%) more than as present tense (31.71%). In B1 (22b), however, there is a trend towards the present tense, as the participants identified the syncretic forms as present tense (50.23%) more than as past tense (34.03%). In both cases it is just as trend, with no statistical significance ($p=0.07$).

In addition to the numerical preference for the past tense in B2 and for the present tense in B1, notice the low percentages of the ambiguity column. Recall that this column represents the participants' notification that the verb form has more than one time marker or more than one-person marker that agrees with them. The low percentages in this column may indicate that the participants did not see a set of values at the verb forms, but rather one value. Likewise, the percentages differences between the two verbal classes in the future column (2.78% in B2 vs. 6.25% in B1), with the significant results between the past and the present tenses in each verb class, suggest that there is more in the tense syncretism than directionality to one tense value, but something concerning the verbs or the verbs classes themselves.

Therefore, I divided the list of verbs according to telicity in order to examine whether the tense choices were an effect of the natural endpoint of the verbs, for both verb classes (see Appendix J). As mentioned in section 3.2.2, the categorization of the verbs to telic and atelic was done by a test of the ability of adding the words 'within' and 'during' to each of the verbs. When the verb is telic, a significant preference for the past is expected, and when the verb is atelic, a significant preference for the **past** is expected.

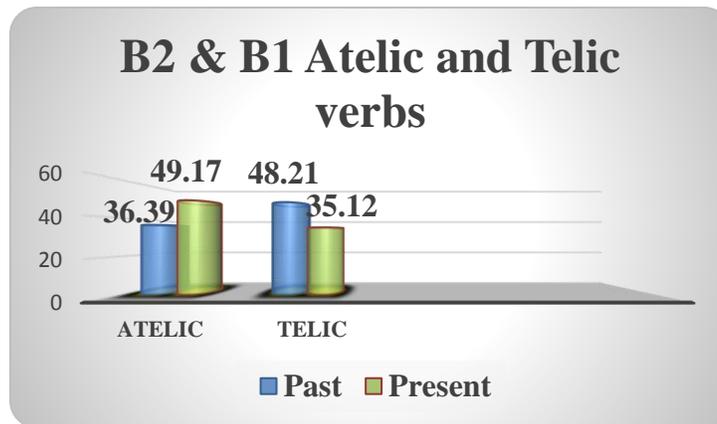
(23) B2 & B1 by telicity

a. Atelic verbs:

Past	Present	Future	Disqualified	Ambiguity
131/360	177/360	11/360	38/360	3/360
36.39%	49.17%	3.06%	10.56%	0.83%
p=0.26				

b. Telic verbs:

Past	Present	Future	Disqualified	Ambiguity
243/504	177/504	28/504	55/504	1/504
48.21%	35.12%	5.56%	10.91%	0.2%
p=0.21				



As expected, when combining the results of B1 and B2 there was a numerical preference for past tense for telic verbs (49.17% vs. 36.39%) and a numerical preference for present tense for atelic verbs (49% vs. 36. %), but both results are statistically insignificant. Tables (24) and (25) present atelic and telic verbs for B2 and B1.

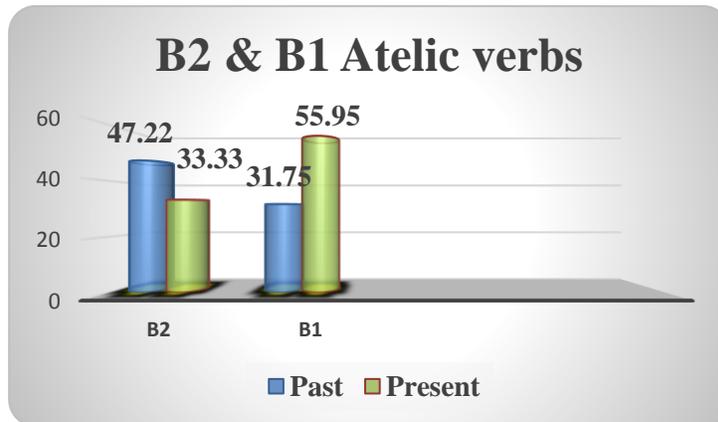
(24) Atelic verbs

a. B2

Past	Present	Future	Disqualified	Ambiguity
51/108	36/108	4/108	16/108	1/108
47.22%	33.33%	3.70%	14.81%	0.92%
p=0.53				

b. B1

Past	Present	Future	Disqualified	Ambiguity
80/252	141/252	7/252	22/252	2/252
31.75%	55.95%	2.78%	8.73%	0.79%
p=0.06				



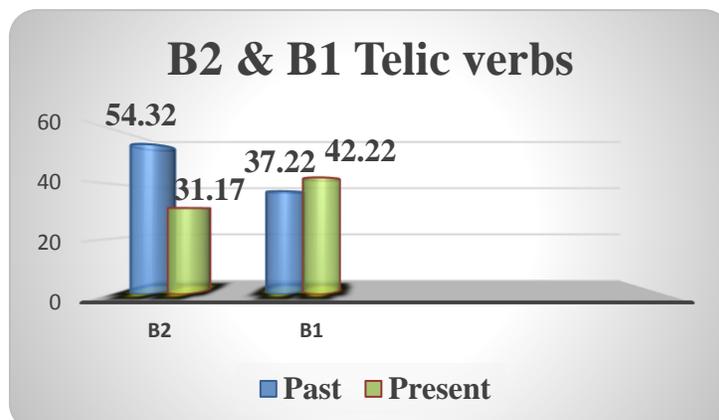
(25) Telic verbs

a. B2

Past	Present	Future	Disqualified	Ambiguity
176/324	101/324	8/324	39/324	0/324
54.32%	31.17%	2.47%	12.04%	0%
p= 0.11				

b. B1

Past	Present	Future	Disqualified	Ambiguity
67/180	76/180	20/180	16/180	1/180
37.22%	42.22%	11.11%	8.89%	0.56%
p= 0.68				



When looking at each verb class, the results seem symmetrical. As expected, telic verbs prefer past tense and atelic prefer present tense, but only for B2 telic (54.32% vs. 31.17%) and B1 atelic (55.95% vs. 31.75%). A numerically opposite trend is found for B2 atelic with unexpected preference for past and B1 telic with unexpected preference for present. However, these preferences were not significant. In conclusion, whether telic or atelic, B2 prefers the past and B1 the present.

5.1.2. Experiment #4

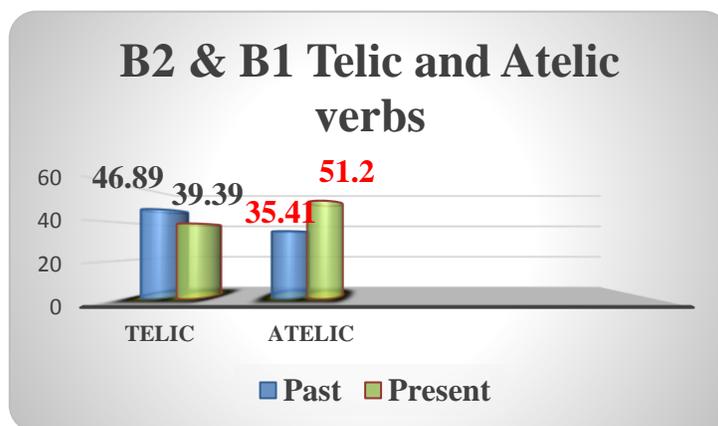
In this section, I present the data of the fourth experiment that also tested the tense syncretism.

Table (26) (a) and (b) display the data by telic and atelic for both, B2 and B1 together.

(26) B2 & B1

a. Telic	Past	Present	Future	Disqualified	Ambiguity
	294/627	247/627	24/627	62/627	0/627
	46.89%	39.39%	3.83%	9.89%	0%
	p= 0.39				

b. Atelic	Past	Present	Future	Disqualified	Ambiguity
	222/627	321/627	19/627	64/627	1/627
	35.41%	51.20%	3.03%	10.21%	0.159%
	p=0.03				



When looking at both verb classes by telicity we find that telic verbs, as expected, have numerical preference for the past (46.89% vs. 39.39%) but insignificant results ($p= 0.39$) and atelic verbs, as expected, have numerical and significant preference for the present (51.20% vs. 35.41% $p=0.03$). The following tables present the data by B2 and B1.

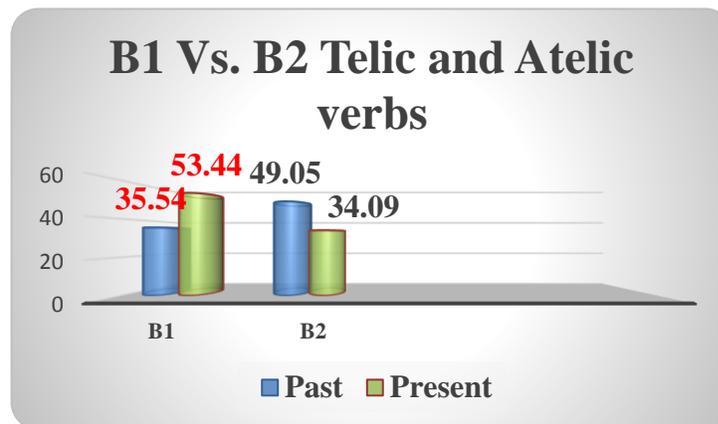
(27) Telic & Atelic verbs

a. B2

Past	Present	Future	Disqualified	Ambiguity
259/528	180/528	12/528	77/528	0/528
49.05%	34.09%	2.27%	14.58%	0%
p= 0.10				

b. B1

Past	Present	Future	Disqualified	Ambiguity
258/726	388/726	31/726	48/726	1/726
35.54%	53.44%	4.27%	6.61%	0.14%
p= 0.008				



Looking at each verb class we can see B2 has numerical preference for the past (49.05% vs. 34.09%) but insignificant results ($p= 0.10$), while B1 has numerical and significant preference for the present (53.44% vs. 35.54% $p= 0.008$). tables (28) and (29) present the data by the division of telic and atelic for B1 and B2.

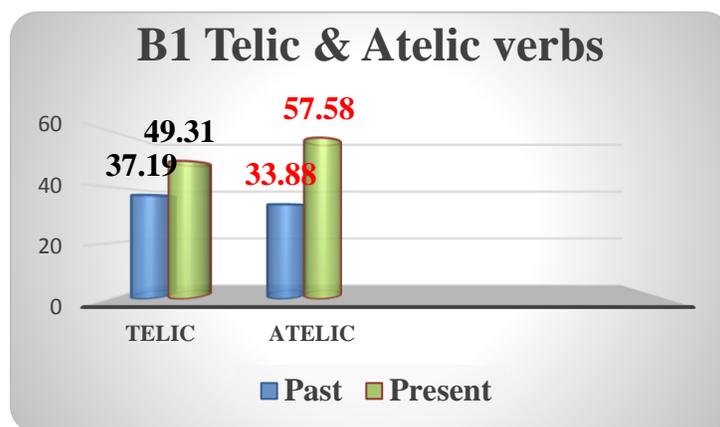
(28) B1 verbs

a. Telic

Past	Present	Future	Disqualified	Ambiguity
135/363	179/363	17/363	32/363	0/363
37.19%	49.31%	4.68%	8.82%	0%
p= 0.14				

b. Atelic

Past	Present	Future	Disqualified	Ambiguity
123/363	209/363	14/363	16/363	1/363
33.88%	57.58%	3.86%	4.41%	0.28%
p= 0.03				



Looking at B1 verbs alone by the division of telic and atelic, we get for telic verbs an unexpected and insignificant numerical preference for the present tense (49.31% vs. 37.19%) (p= 0.14), while for the atelic verbs we get, as expected, numerical and significant preference for the present tense (57.58% vs. 33.88%) (p=0.03).

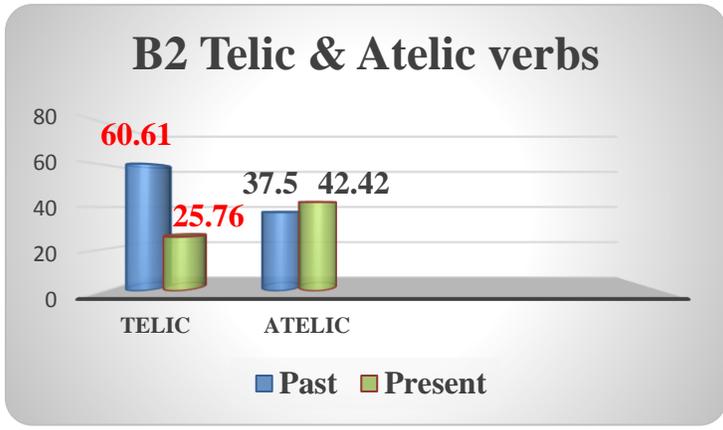
(29) B2 verbs

a. Telic

Past	Present	Future	Disqualified	Ambiguity
160/264	68/264	7/264	29/264	0/264
60.61%	25.76%	2.65%	10.98%	0%
p= 0.02				

b. Atelic

Past	Present	Future	Disqualified	Ambiguity
99/264	112/264	5/264	48/264	0/264
37.50%	42.42%	1.89%	18.18%	0%
p= 0.55				



Looking at B1 verbs alone by the division of telic and atelic, we get for the telic verbs, as expected, numerical and significant preference for the past (60.61% vs. 25.76%) ($p= 0.02$) and for the atelic verbs, as expected, numerical preference for the present (42.42% vs. 37.50%), but insignificant results ($p= 0.55$).

In order to test if there are gender differences for B1 verbs I divided the data by masculine verbs and feminine verbs in tables (30 (a) and (b)).

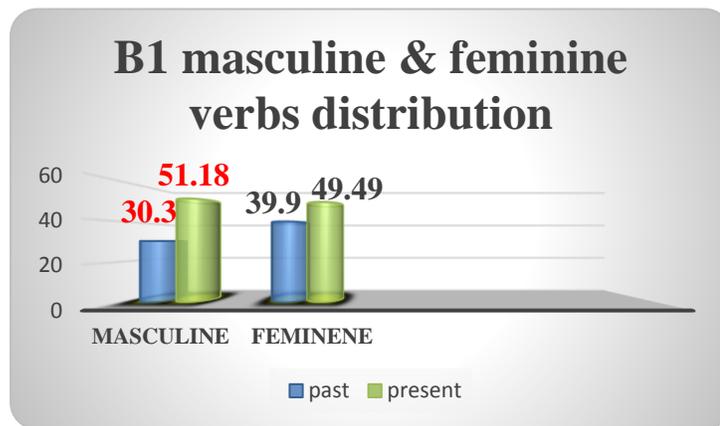
(30) B1 verbs – masculine & feminine

a. Masculine

Past	Present	Future	Disqualified	Ambiguity
100/330	192/330	17/330	21/330	0/330
30.3%	51.18%	5.15%	6.36%	0%
p= 0.01				

b. Feminine

Past	Present	Future	Disqualified	Ambiguity
158/396	196/396	14/396	27/396	1/396
39.90%	49.49%	3.54%	6.82%	0.25%
p= 0.27				



Looking for gender differences in B1 verbs we see that feminine verbs have an unexpected numerical preference for the present tense (49.49% vs. 39.90%), but not significant ($p= 0.27$), while for masculine verbs we see numerical and significant preference for the present tense (51.18% vs. 30.3%) ($p= 0.01$).

5.1.3. Summary

In this section, I present a summary for the results for both of the tense syncretism experiments in order to see the tendency.

(31)

Experiment	Table	Sorted by	Past	Present	p
#1	(21)	B2&B1	43.29%	40.97%	.78
#1	(22) a.	B2	52.55%	31.71%	.07
#1	b.	B1	34.03%	50.23%	.07
#1	(23) a.	B2&B1 Atelic	36.39%	49.17%	.26
#1	b.	Telic	48.21%	35.12%	.21
#1	(24) a.	Atelic B2	47.22%	33.33%	.53
#1	b.	B1	31.75%	55.95%	.06
#1	(25) a.	Telic B2	54.32%	31.17%	.11
#1	b.	B1	37.22%	42.22%	.68
#4	(26) a.	B2&B1 Telic	46.89%	39.39%	.39
#4	b.	Atelic	35.41%	51.20%	.03
#4	(27) a.	Telic &Atelic B2	49.05%	34.09%	.10
#4	b.	B1	35.54%	53.44%	.008
#4	(28) a.	B1 Telic	37.19%	49.31%	.14
#4	b.	Atelic	33.88%	57.58%	.03
#4	(29) a.	B2 Telic	60.61%	25.76%	.02
#4	b.	Atelic	37.50%	42.42%	.55
#4	(30) a.	B1 Ms.	30.3%	51.18%	.01
#4	b.	Fm.	39.90%	49.49%	.27

In the following table, I summarize the data by the binyanim: B1 and B2 in order to see the tendency of B1 for the present tense and B2 for the past

(32)

B1:	(22)	b.		34.03%	50.23%	.07
	(28)	a.	Telic	37.19%	49.31%	.14
		b.	Atelic	33.88%	57.58%	.03
	(30)	a.	Ms.	30.3%	51.18%	.01
b.		Fm.	39.90%	49.49%	.27	
B2:	(22)	a.		52.55%	31.71%	.07
	(29)	a.	Telic	60.61%	25.76%	.02
		b.	Atelic	37.50%	42.42%	.55

5.1.4. Tense syncretism Discussion

The goal of this study was to find the type of relation holding between syncretic forms within each paradigm in MH; is it directional or symmetrical. For the tense syncretism, it is possible to dismiss symmetrical syncretism between the two tense values; past and present.

At the same time, it is hard to conclude also for directionality for past or present tenses, since none of the two values is discernible in a systematic and significance manner, even based on telicity. Since, B2 prefers the past and B1 prefers the present, it is not possible to learn about the organization of morphological features and feature values in the lexicon or about the morphological hierarchy and markedness relations, but it may indicate bidirectional relation. .

The preference of B1 for the present maybe because this is a relatively smaller set of verbs with a monosyllabic stem, while verbs in Hebrew are usually disyllabic. The numerical differences between the two genders at B1 verbs may involve from recognition the feminine verbs more as past tense than the masculine verbs because the suffix – a that represent in feminine verbs in the past tense.

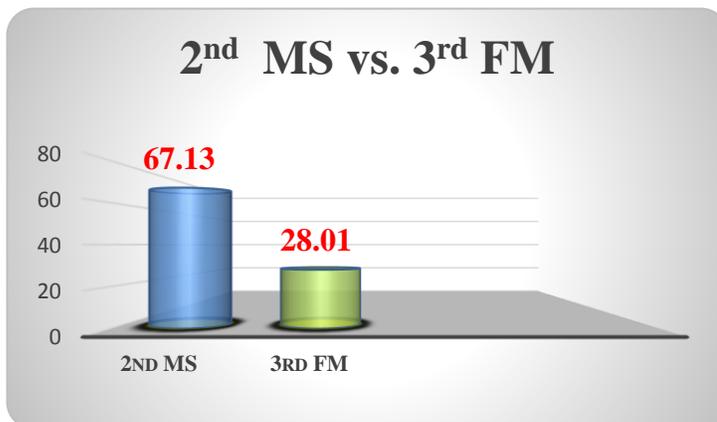
A strong support for directionality is the low percentages of the ambiguity, where ambiguity indicates when the participants noted that the verb forms could have more than one tense marker. The fact that the participants hardly ever noticed the syncretism may indicate that the participants associated only one value with a verb form.

5.2. Combined Person and Gender syncretism

In this section, I present the data for the combined person and gender syncretism. Table (33) displays significant results ($p=0.000003$) for the 2nd MS and 3rd FM Combined Person and Gender syncretism with identification of 67.13% of the verbs as the 2nd MS and 28.01% as the 3rd FM. These results indicate that although the third person is the unmarked morpho-syntactic value for the person feature, the 2nd MS prevails with the marked feature gender and the unmarked morpho- syntactic feature value –masculine.

(33) 2nd MS and 3rd FM Combined Person and Gender syncretism

2.MS	3.FM	Disqualified	Ambiguity
290/432	121/432	15/432	6/432
67.13 %	28.01%	3.47%	1.39%
p=0.000003			



5.2.1 Combined Person and Gender syncretism – Discussion

For the Combined Person and Gender syncretism relation holding between the syncretic forms is, directional. The results indicate, in a significant manner, for directional syncretism when the determinant value is the 2nd MS. In addition, as in the tense syncretism, the low percentage of the ambiguity column may indicate that the participants are not aware that the forms are syncretic and it may further prove that there is no symmetry between the attribute values, i.e. the participants associate only one value with a verb form.

The question that arise is what we can learn from this directionality about the organization of morphological features and feature values in the lexicon and about their hierarchy and markedness relations. Several questions arise: does the masculine gender feature value determine the feminine value or does the second person feature value determine the third person feature value? Is it the features values or the features that determinants?

According to Noyer's (1992) and Harley and Ritter's (2002) Universal Feature Hierarchies, person is less marked than gender (Person > Number > Gender), third person is less marked than second person is (3rd > 1st > 2nd), and masculine is less marked than feminine (Masculine > Feminine). Thus, although there is a conflict between the less marked third person (3.FM.SG) and the less marked masculine gender (2.MS.SG), the hierarchy Person > Gender grants priority to gender.

The results can implicate that the 2.MS.SG is more accessible for the speaker than the 3.FM.SG. However, considering Noyer's (1992) and Harley and Ritter's (2002) Universal Feature Hierarchy it seems that a combined feature syncretism cannot implicate on the hierarchical structure or markedness relationships since it's not clear who the determinants are - the features or the features values, and which of the values.

The preference of the second person may be due to the prominence of the prefix *t-* in 2nd person forms, as it appears in the singular masculine and feminine forms (*tigmor* '2.MS.SG.FUT

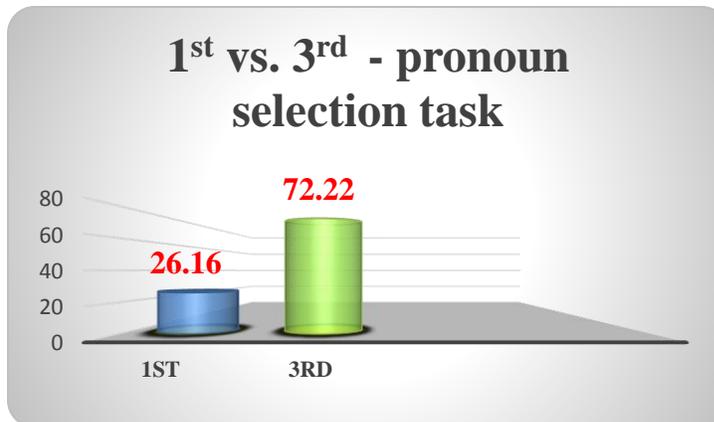
finish’, *tigmeri* ‘2.FM.SG.FUT finish’), as well as in the plural (e.g. *tigmeru* ‘2.PL.FUT’). The third person prefix is usually *y-* (e.g. *yigmor* ‘3.MS.SG.FUT’, *yigmeru* ‘3.PL.FUT’), and the syncretic form *tigmor* is thus immediately identified as second person. This explanation is consistent with Stump’s approach (see section 2). Likewise, the second person form is also accessible as an imperative form and therefore more identified with the verb form.

5.3. Person syncretism

The tables in (34) display the first and third Person syncretism, which as noted in section 3.3, is limited to colloquial speech and seems to indicate a change in the language, i.e. from two distinct forms towards one syncretic form. Table (34a) displays the results of the pronoun selection task (see section 4.4 experiment 2), in which the participants had to choose a pronoun for each of the verb forms. Table (34 b) displays the results for the sentence completing task (see section 4.4 experiment 3) where the participants had to select a verb that agrees with the first person pronoun in agent position. Due to the effects of assimilation in production, where there is preference for the third person *y-* prefix because of the final /i/ in the first person pronoun (e.g. *ani yevakeɤ*), I inserted in some of the questionnaires the word ‘no’ immediately after the pronoun and before the verb completion bar, in order to remove the environment of assimilation. These results are shown in tables (35) (s) and (35) (b).

(34) 1st and 3rd- currently developing syncretism

a. Pronoun selection	1 st	3 rd	Disqualified	Ambiguity
	113/432	312/432	6/432	1/432
	26.16%	72.22%	1.39%	0.23%
	p= 0.01			



b. Verb completion

1 st	3 rd	Disqualified	Ambiguity
187/360	151/360	22/360	0/360
51.94%	41.94%	6.11%	0%
p=0.31			

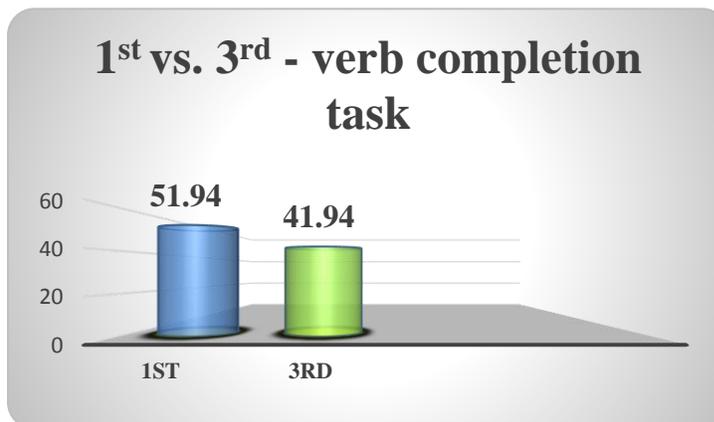


Table (34a) shows a statistically significant preference for the third person, with 72.22% ($p < 0.01$) identification of the verb as the third person form. These results show that the normative form of the third person identified as the third person. Nevertheless, there was 26.16% identification of the first person, which suggests a certain degree of syncretism. Moreover, looking at the results of each of the participants (see Appendix J), it can be seen that 26 of the 36 participants identify the third Person verbs forms as the first at least one time.

This person syncretism gains further support in table (34 b), which shows the results of the sentence completion task, where the participants had to add to a sentence a verb that agrees with the first person agent. Although there was a numerical preference (51.94%) for the normative first person (e.g. *avakek*), there was still a considerable number of hits (41.94%) on the third person (e.g. *yevakek*).

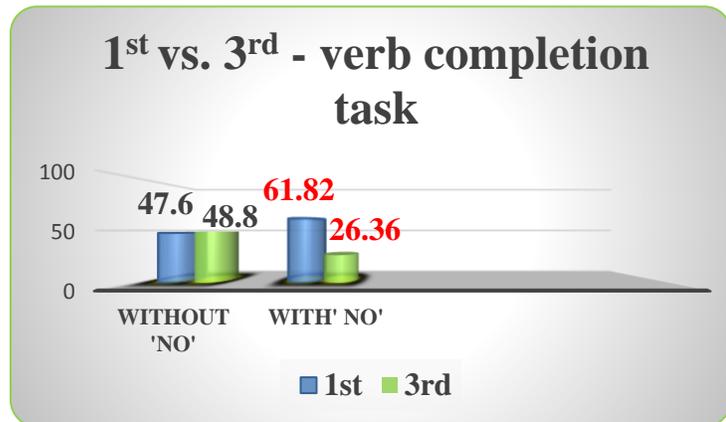
(35) Verb completion task- with and without 'no'

a. Verb completion without 'no'

1 st	3 rd	Disqualified	Ambiguity
119/250	122/250	9/250	0/250
47.6%	48.8%	3.6%	0%
p= 0.75			

b. Verb completion with 'no'

1 st	3 rd	Disqualified	Ambiguity
68/110	29/110	13/110	0/110
61.82%	26.36%	11.82%	0%
p= 0.00001			



The tables in (35) suggest that the presence (34a) vs. absence (35b) of assimilation environment in production does play a role in verb selection (recall that this was a written task). Table (35a) shows that there is no preference for one verb form over the other when it has produced immediately after the pronoun (47.6% vs. 48.8). However, there is a statistically

significant preference ($p < 0.00001$) for the first person (61.82 % vs. 23.36%) when there is no assimilation environment, i.e. when the verb to be selected is not immediately after the /i/-final first person pronoun *ani*. If the phonology environment was the trigger for the syncretic forms, by now it is not the only factor since still in 26.36 % of the cases the participant produced the third verb form.

5.3.1 Person syncretism discussion

The results for the developing syncretism may show that there is no syncretism, but rather assimilation. However, if there is syncretism, as in the tense syncretism, it is not possible to claim for symmetrical or directional syncretism. The results of task 1, where the participants had to identify the agreement person value of the verbs form, show for directional syncretism when the 3rd person the determinate value, while the results of task 2 for the completion of the verb according to his agrees person, show for symmetrical syncretism between the two values. The distinction between the results of the two tasks do not allow to determine how the two morpho – syntactic feature values associated with a single form. However, they may indicate the process of a currently developing syncretism, when the production of the verb form may agree in a symmetrical manner for both person values; however, the identification of the verb form is yet powerful for his original person value. Additionally, the phonology environment has an influence on the chosen verb form. When the verb completion is not immediately after the pronoun, i.e., there is no continuity between the pronoun and the verb form, the first person verb form is the determinant, but when the verb completion is immediately after the pronoun, the third person verb form is the determinant.

6. Discussion

The purpose of this study was to provide quantitative data from four experiments I conduct, aiming to determine how a syncretic set of morpho-syntactic features values associated with a

single form in MH. Is it directional syncretism, where the morpho-syntactic set of feature values of one form spread to another form or symmetrical syncretism, whereby there is no indication of which of the values is the determinant (Baerman, Brown and Corbett 2005)? Summarizing the results of the three cases of syncretism in question, the findings show no symmetrical effects between none of the syncretic features values, however, it is not always possible to determine for directionality. In the tense syncretism, it is not possible to determine for the two binyanim if the past or the present is the determiner, but it is possible to notice that there is difference between them. B1 prefer the present and B2 the past. For the combined person & gender syncretism, the results do show which values (of person and of gender) determines, but an attempt to answer whether this directionality reflects any hierarchical markedness relationships, is not possible. The findings for currently developing syncretism is more complicated. When the participants compose a sentence for the verb form they identified it, in a directional manner as the third person (and as the first person), but when the participants produce the verbs forms, when the pronoun which agrees with the verb is the first person, the results show a symmetrical use in both values- first and third person. A very important conclusion that arises from this experiment is that all the participants, except a very few cases, didn't notice that the verb forms are syncretic and saw in each of the syncretic forms only one feature value and no ambiguity of values. Hence suggests that for each of the participants there is more accessible feature value that identified with the verb form (see the ambiguity columns in the different tables in section 5). Possible explanation for some instances of syncretism and directionality can be diachronic changes that are not possible to track, especially in a language like MH. In order to reveal a more conclusive results additional study in needed with a larger set of verbs or a larger and more diverse group of participant in terms of age.

Appendix A: Example of a questionnaire

תודה רבה שהסכמת להשתתף בניסוי שלי ☺

שם: _____

גיל: _____

מין: א. נקבה ב. זכר

ארץ לידה: _____

במידה והינך עולה חדש/ה, ציין/צייני את גיל העלייה: _____

מהי השפה המדוברת בבית עם אביך ?

א. עברית

ב. רוסית

ג. ערבית

ד. אנגלית

ה. אחר _____

מהי השפה המדוברת בבית עם אמך ?

א. עברית

ב. רוסית

ג. ערבית

ד. אנגלית

ה. אחר _____

משימה א: לפניך רשימת פעלים. חבר/י לכל פועל משפט תוך שימוש במילת זמן: אתמול, עכשיו או מחר המציינת את זמן הפעולה.

לדוגמה: אכלנו – אכלנו אתמול במסעדה.

תשבי – מחר תשבי על הדשא.

1.	מְדַבֵּר
2.	כָּתַב
3.	נִפְרָד
4.	תִּתְרַגְּשׁוּ
5.	קָם
6.	תִּקְפָּצִי
7.	נִשְׁמַר
8.	אֵלֵךְ
9.	רָץ
10.	נִשְׁמֹר
11.	יְדַבֵּר
12.	כָּא
13.	מִתְקַדְּמִים
14.	שָׁרָה
15.	תִּתְלַבֵּשׁ
16.	נִרְקַב
17.	מִתְעַמְּלִים
18.	נָשַׁב
19.	מְנַמֵּכָה
20.	נִרְפָּא
21.	כָּאַה
22.	מִתְלַבְּשִׁים
23.	נִשְׁרֵט
24.	שָׁמְרָתִי
25.	נִגְמַר
26.	נָרַץ
27.	מְרַגֵּשׁ
28.	נִשְׁאַר
29.	תִּבְנֶשֶׁק

נְדָהִים	.30
מְבֹטְלִים	.31
נִכְנָס	.32
נִצְמַד	.33
רָב	.34
יָלוּד	.35
מִתְקַרֵּב	.36
זָז	.37
נִרְדָּם	.38
צָצָה	.39
יִשְׁתַּקֵּוּ	.40
לָשָׂה	.41
נִגְנַב	.42
נָח	.43

משימה ב: לפניך רשימת פעלים. חבר/י לכל פועל משפט תוך שימוש בגוף המבצע.

לדוגמה: **אנחנו** אכלנו אתמול במסעדה. – **אכלנו**

תשבי – **מחר את תשבי** על הדשא.

הִפְחִיד	.1
תִּלְמַד	.2
יִתְקַשֵּׁר	.3
הִתְקַדְּמוּ	.4
תִּסְפּוּר	.5
מְסַדְּרִים	.6
תִּתְקַדְּם	.7
יִשְׁמֹר	.8
הִתְאַהֲבוּ	.9
תִּפְרְתִי	.10
תִּשְׁתַּוֵּק	.11
יִפְרַד	.12
תִּחְלִיטוּ	.13
תִּלְבַּשׁ	.14

מתרגֶשֶׁת	.15
יִכְנֹס	.16
נִשְׁכַּח	.17
תִּחַפֵּשׁ	.18
מֵאַחֵר	.19
יִרְקֹד	.20
נִסְעֵנוּ	.21
יִרְגִישׁ	.22
יִתְאַרְגֵּן	.23
תִּדְבֵר	.24
יִלְמַד	.25
נִדְבֵר	.26
תִּנְשֵׁק	.27
יִגִיעַ	.28
מִרְגִיזָה	.29
כְּדֻקָּתָהּ	.30
תִּתְרַגֵּשׁ	.31
יִפְגֹּשׁ	.32
מִחִפְּשֵׁת	.33
תִּפְרִיעַ	.34
הִתְקַדְמָה	.35
יִסְבִּיר	.36
תִּשְׁחַק	.37
תִּתְקַשְׁרֵי	.38
יִקְבֹּל	.39
הִתְאַפְּקוּ	.40
הִרְגִישׁוּ	.41
תִּשְׁמֹר	.42
נִקְשֵׁר	.43

משימה ג: לפניך רשימת משפטים. קרא/קראי כל משפט וחברי משפט חדש בו את/ה מבצע/ת את הפעולה.

לדוגמה: אתה החזרת את הספר – אני החזרתי את הספר.

היא יושבת על הדשא – אני יושב על הדשא.

- | | | | | |
|-----|--------------------------------------|--------------|-------|-----------------|
| 1. | שבוע שעבר הוא בָּקַר
אצל הרופא. | מחר אני | _____ | אצל הרופא. |
| 2. | אתמול היא מָכְרָה את
הפלאפון שלה. | עכשיו
אני | _____ | את הפלאפון שלי. |
| 3. | מחר היא תִּחְלֶיק על
השלג. | מחר אני | _____ | על השלג. |
| 4. | עכשיו הוא רוֹקֵד במסיבה. | מחר אני | _____ | במסיבה. |
| 5. | עכשיו היא רוֹקֵדֶת
במסיבה. | אתמול
אני | _____ | במסיבה. |
| 6. | מחר את תִּתְקַשְׁרִי אליו. | מחר אני | _____ | אליו. |
| 7. | עכשיו את שוֹלַחַת הודעה
בווטסאפ. | עכשיו
אני | _____ | הודעה בווטסאפ. |
| 8. | הוא פָּתַח את המתנה
אתמול. | מחר אני | _____ | את המתנה. |
| 9. | היא מְדַבֶּרֶת איתך על
הנושא. | מחר אני | _____ | איתך על הנושא. |
| 10. | מחר אנחנו נִקְבֵּל את
המשלוח. | אתמול
אני | _____ | את המשלוח. |
| 11. | הם בוֹדְקִים את האוטו
עכשיו. | מחר אני | _____ | את האוטו. |
| 12. | היא לֹטְפָה את הכלב. | עכשיו
אני | _____ | את הכלב. |
| 13. | אתם תִּכְתְּבוּ את הפרטים. | מחר אני | _____ | את הפרטים. |
| 14. | מחר את תִּפְרִיעֵי בהרצאה
. | שלשום
אני | _____ | בהרצאה. |
| 15. | 'אנחנו נִבְקֵשׁ מועד ב' | מחר אני | _____ | מועד ב'. |
| 16. | מחר הם יִפְגְּשוּ את
המורה. | עכשיו
אני | _____ | את המורה. |
| 17. | אתה תִּרְגִּיעַ את הכלב. | מחר אני | _____ | את הכלב. |

Appendix B: example of a questionnaire of experiment #4 - tense syncretism

משימה א: לפניך רשימת פעלים. חבר/י לכל פועל משפט תוך שימוש במילת זמן: אתמול, עכשיו או מחר המציינת את זמן הפעולה.

לדוגמה: אכלנו – אכלנו אתמול במסעדה.
תשבי – מחר תשבי על הדשא.

- | | | |
|-------|----------------|-----|
| _____ | מְדַבֵּר | .1 |
| _____ | פָּתַב | .2 |
| _____ | נִפְרָד | .3 |
| _____ | שָׁכָה | .4 |
| _____ | תִּתְרַגְּשׁוּ | .5 |
| _____ | נִזְהַר | .6 |
| _____ | קָם | .7 |
| _____ | רָבָה | .8 |
| _____ | תִּקְפָּצִי | .9 |
| _____ | נִשְׁמַר | .10 |
| _____ | אָלַף | .11 |
| _____ | קָמָה | .12 |
| _____ | נִמְנַע | .13 |
| _____ | רָץ | .14 |
| _____ | נִשְׁמָר | .15 |
| _____ | רָצָה | .16 |
| _____ | יְדַבֵּר | .17 |
| _____ | נִדְבַק | .18 |

	גרה	.19
	בָּא	.20
	רבה	.21
	מִתְקַדְּמִים	.22
	שָׁרָה	.23
	תִּתְלַבֵּשׁ	.24
	גִּרְקָב	.25
	זזה	.26
	מִתְעַמְּלִים	.27
	נזקק	.28
	שָׁב	.29
	מִנְמִיכָה	.30
	גִּרְפָּא	.31
	בָּאָה	.32
	מִתְלַבְּשִׁים	.33
	נִשְׂרָט	.34
	שְׁמֵרְתִי	.35
	נִגְמַר	.36
	גָּר	.37
	מִרְגִּישׁ	.38
	נשען	.39
	נחה	.40
	שם	.41

	נְשָׂאֵר	.42
	תְּנַשֵּׂק	.43
	נְדָהִם	.44
	מִבְטָלִים	.45
	נִכְנָס	.46
	נִצְמַד	.47
	רָב	.48
	יִלְדוּ	.49
	מִתְקַרֵּב	.50
	שָׁמָּה	.51
	זֶז	.52
	גִּרְדָּם	.53
	תָּמָה	.54
	צָצָה	.55
	יִשְׁחַקּוּ	.56
	תָּם	.57
	נִגְנָב	.58
	נָח	.59

Appendix C: Materials for the three experiments.

Verb class = *binyan*: I pa'al, II – nifal, III – hif'il, IV – pi'el, V – hitpa'el, N^{sub} – a subclass of class N.

Experiment #1 (organized by the order of one of the questionnaire)

	Tested verb	Distractor		Verb	Verb class	
1.	מְדַבֵּר		✓	'taking'	medabeκ	IV
2.	כָּתַב		✓	'wrote'	katav	I
3.	נִפְרַד	✓		'brake up/braking up'	nifκad	II
4.	תִּתְרַגֵּשׁוּ		✓	'will get excited'	titκagfu	V
5.	קָם	✓		'got up/ getting up'	kam	I ^{sub}
6.	תִּקְפֹּצֵי		✓	'will jump'	tikpetsi	III
7.	נִשְׁמַר	✓		'kept'/ keeps'	nifmaκ	II
8.	אָלַף		✓	'will walk'	elex	I
9.	רָץ	✓		'ran'/ 'run'	κats	I ^{sub}
10.	נִשְׁמָר		✓	'will keep'	nifmoκ	I
11.	יְדַבֵּר		✓	'will talk'	yedabeκ	IV
12.	בָּא	✓		'came'/ 'comes'	ba	I ^{sub}
13.	מִתְקַדְּמִים		✓	'progressing'	mitkadmim	V
14.	שָׁרָה	✓		'sang'/ 'singing'	ʃava	I ^{sub}
15.	תִּתְלַבֵּשׁ		✓	'will get dress'	titlabef	V
16.	גִּרְקַב	✓		'rotted'/ 'rot'	nifκav	II
17.	מִתְעַמְּלִים	✓		'exercising'	kitamlim	V
18.	שָׁב	✓		'returned'/ returns'	ʃav	I ^{sub}
19.	מַנְמִיכָה		✓	'lowers'	manmixa	III
20.	נִרְפָּא	✓		'healed'/ 'heals'	nifpa	II
21.	בָּאָה	✓		'came/ comes'	baa	I ^{sub}
22.	מִתְלַבְּשִׁים		✓	'getting dress'	mitlabʃim	V
23.	נִשְׁרַט	✓		'scratched / scratching'	nifκat	II
24.	שָׁמַרְתִּי		✓	'I kept'	ʃamaκti	I
25.	נִגְמַר	✓		'finished'/ 'finishes'	nigmaκ	II
26.	גָּר	✓		'lived'/ 'lives'	gaκ	I ^{sub}
27.	מִרְגִּישׁ		✓	'feeling'	maκgif	III
28.	נִקְרַע	✓		'tore'/tearing'	nifκa	II
29.	תִּנָּשֵׁק		✓	'will kiss'	tenafek	IV
30.	נִמְנַע	✓		'prevented'/ prevents'	nimna	II
31.	מַבְטֵלִים		✓	'cancels'	mevatlim	IV
32.	נִכְנַס	✓		'entered'/entering'	nixnas	II
33.	נִצְמַד	✓		'clung'/ 'clings'	nifmad	II
34.	רָב	✓		'quarreled'/ 'quarrels'	κav	I ^{sub}

35.	יֵלֵךְ	✓	‘will go’	yelex	I
36.	מִתְקַרֵּב	✓	‘getting close’	mitkaʁev	V
37.	זָז	✓	‘moved’/‘moving’	zaz	Isub
38.	נִרְדָּם	✓	‘fell asleep’/ falls asleep’	niʁdam	II
39.	צָצָה	✓	‘popped up’/‘ pop up’	tsatsa	I ^{sub}
40.	יִשְׁחַקוּ	✓	‘ will play’	yesaxaku	IV
41.	לָשָׂה	✓	‘kneaded’/ ‘kneads’	laʃa	I ^{sub}
42.	נִגְנַב	✓	‘was stolen’/ ‘is stolen’	nignav	II
43.	נָח	✓	‘rested’/ ‘rests’	nax	I ^{sub}

Experiment #2 (organized by the order of one of the questionnaires)

	Tested verb	Distractor		The verb	Verb class
1.	הִפְחִיד	✓	‘scared’	hifxid	III
2.	תִּלְמַד	✓	‘will learn’	tilmad	I
3.	יִתְקַשֵּׁר	✓	‘will call’	yitkaʃev	V
4.	הִתְקַדְּמוּ	✓	‘progressed’	hitkadammu	V
5.	תִּסְפּוֹר	✓	‘will count’	tispor	I
6.	מְסַדְּרִים	✓	‘organizing’	mesadkim	IV
7.	תִּתְקַדֵּם	✓	‘will progress’	titkadem	V
8.	יִשְׁמֹר	✓	‘will watch’	yisomor	I
9.	הִתְאַהֲבוּ	✓	‘fell in love’	hita’avu	V
10.	תִּפְרֹתִי	✓	‘sewed’	tafakti	I
11.	תִּשְׁתּוֹק	✓	‘will shat up’	tistok	I
12.	יִפְרֹד	✓	‘will break up’	yipaved	II
13.	תִּחְלִיטוּ	✓	‘will decide’	taxlitu	III
14.	תִּלְבֹּשׁ	✓	‘will get dress’	tilbaʃ	III
15.	מִתְרַגֵּשׁת	✓	‘getting excited’	mitrageʃet	V
16.	יִכְנֵס	✓	‘ will enter’	yikanes	II
17.	נִשְׁכַּח	✓	‘ forgotten’	niʃkax	II
18.	תִּחְפֹּשׂ	✓	‘will look for’	texapes	IV
19.	מְאַחֵר	✓	‘to be late’	meaxev	IV
20.	יִרְקוֹד	✓	‘ will dance’	yirkod	I
21.	נִסְעָנוּ	✓	‘rode’	nasanu	I
22.	יִרְגִּישׁ	✓	‘will feel’	yargiʃ	III
23.	יִתְאָרְגֵן	✓	‘will be organize’	yitargen	V
24.	תִּדְבֹּר	✓	‘ will talk’	tedabev	IV
25.	יִלְמַד	✓	‘will learn’	yilmad	I
26.	נִדְבֹּר	✓	‘will talk’	nedabev	IV

27.	תנשק	✓		‘will kiss’	tenafek	IV
28.	יגיע	✓		‘will arrive’	yagia	III
29.	מרגיזה		✓	‘annoying’	maɣgiza	III
30.	בדקת		✓	‘will check’	badakta	I
31.	תתרגש	✓		‘will be excited’	titɣageʃ	V
32.	יפגוש	✓		‘will meet’	yifgoʃ	I
33.	מחפשת		✓	‘looking for’	mexapeset	IV
34.	תפריע	✓		‘will disturb’	tafɣia	III
35.	התקדמה		✓	‘progressed’	hitkadma	V
36.	יסביר	✓		‘will explain’	yasbiɣ	III
37.	תשחק	✓		‘will play’	tesaxek	IV
38.	תתקשרי		✓	‘will call’	titkaʃbi	V
39.	יקבל	✓		‘will except’	yekabel	IV
40.	התאפקתם		✓	‘restrained’	hitapaktem	V
41.	הרגישו		✓	‘felt’	hiɣɣifu	III
42.	תשמור	✓		‘will watch’	tijmor	I
43.	נקשר		✓	‘tied’	nekaʃeɣ	II

Experiment #3 (organized by the order of one of the questionnaire)

Sentence	Tested verb	Distractor	Verb	Verb class
1. בשבוע שעבר הוא ביקר אצל הרופא.	✓		‘visited’	bikeɣ IV
2. אתמול היא מכרה את הפלאפון שלה.		✓	‘sell’	maxɣa I
3. מחר היא תחליק על השלג.	✓		‘will slip’	taxlik III
4. עכשיו הוא רוקד במסיבה.	✓		‘dancing’	ɣoked I
5. עכשיו היא רוקדת במסיבה.		✓	‘dancing’	ɣokedet I
6. מחר את תתקשרי אליו.	✓		‘will call’	titkaʃbi V
7. עכשיו את שולחת הודעה בווטסאפ.		✓	‘send’	ʃolaxat I
8. הוא פתח את המתנה אתמול.	✓		‘opened’	potxim I
9. היא מדברת איתך על הנושא.	✓		‘talking’	medabeɣ IV
10. מחר אנחנו נקבל את המשלוח.		✓	‘will get’	nekabel IV
11. הם בודקים את האוטו עכשיו.	✓		‘checking’	bodkim I
12. היא לטפה את הכלב.		✓	‘petted’	litfa IV
13. אתם תכתבו את הפרטים.	✓		‘will write’	tixtevu I
14. מחר את תפריעי בהרצאה.		✓	‘will disturb’	tafriʔi III
15. אנחנו נבקש מועד ב’.	✓		‘will ask’	nevakeʃ I
16. מחר הם יפגשו את המורה.		✓	‘will meet’	yifgeʃu I
17. אתה תרגיע את הכלב.	✓		‘will relax’	taɣgia III

Appendix D: experiment #4 - tense syncretism Materials used in the experiment arranged by the experiment.

Verb classes = *binyanim*: I – pa'al, II – nifal, III – hif'il, IV – pi'el, V – hitpa'el. N^{sub} – a subclass of class N

The verb class	The verb	English translation	Distractor	A tested verb	
IV	medabek	'taking'	✓	מדבר	.44
I	katav	'wrote'	✓	כתב	.45
II	nifkad	'brake up/braking up'		✓	נפרד .46
V	titragfu	'will get exited'	✓	תתרגשו	.47
I ^{sub}	kam	'got up/ getting up'		✓	קם .48
III	tikpetsi	'will jump'	✓	תקפצי	.49
II	nifmak	'kept'/ keeps'		✓	נשמר .50
I	elex	'will walk'	✓	אלך	.51
I ^{sub}	rats	'ran'/ 'run'		✓	רץ .52
I	nifmok	'will keep'	✓	נשמור	.53
IV	yedabek	'will talk'	✓	ידבר	.54
I ^{sub}	ba	'came'/ 'comes'		✓	בא .55
V	mitkadmim	'progressing'	✓	מתקדמים	.56
I ^{sub}	jav	'sang'/ 'singing'		✓	שרה .57
V	titlabef	'will get dress'	✓	תתלבש	.58
II	nivkav	'rotted'/ 'rot'		✓	גרקב .59
V	mitamlim	'exercising'		✓	מתעמלים .60
I ^{sub}	jav	'returned'/ returns'		✓	שב .61
III	manmixa	'lowers'	✓	מנמיכה	.62

II	niɤpa	‘healed’/’heals’	✓	גִּרְפָּא	.63
I ^{sub}	baa	‘came/ comes’	✓	בָּאָה	.64
V	mitlabʃim	‘getting dress’	✓	מִתְלַבְּשִׁים	.65
II	niskat	‘scratched’/ ‘scratching’	✓	נִשְׂרַט	.66
I	ʃamaɤti	‘I kept’	✓	שָׁמַרְתִּי	.67
II	nigmaɤ	‘finished’/ ‘finishes’	✓	נִגְמַר	.68
I ^{sub}	gaɤ	‘lived’/ ‘lives’	✓	גָּר	.69
III	maɤgijʃ	‘feeling’	✓	מְרַגֵּשׁ	.70
II	niɤka	‘tore’/’tearing’	✓	נִקְרַע	.71
IV	tenaʃek	‘will kiss’	✓	תִּנְשֵׁק	.72
II	nimna	‘prevented’/’ prevents’	✓	נִמְנַע	.73
IV	mevatlim	‘cancels’	✓	מְבַטְּלִים	.74
II	nixnas	‘entered’/’entering’	✓	נִכְנַס	.75
II	nitsmad	‘clung’/ ‘clings’	✓	נִצְמַד	.76
I ^{sub}	ɤav	‘quarreled’/ ‘quarrels’	✓	רָב	.77
I	yelix	‘will go’	✓	יֵלֵךְ	.78
V	mitkaɤev	‘getting close’	✓	מִתְקַרֵּב	.79
Isub	zaz	‘moved’/’moving’	✓	זָז	.80
II	niɤdam	‘fell asleep’/ falls asleep’	✓	נִרְדַּם	.81
I ^{sub}	tsatsa	‘popped up’/’ pop up’	✓	צָצָה	.82
IV	yesaxaku	‘ will play’	✓	יִשְׁחַקוּ	.83
I ^{sub}	lafa	‘kneaded’/ ‘kneads’	✓	לִישָׂה	.84
II	nignav	‘stole’/ ‘steals’	✓	נִגְנַב	.85
I ^{sub}	nax	‘rested’/ ‘rests’	✓	נָח	.86

Appendix E: B2 Past and Present (participle) tense syncretism for each of the verbs

Verbs	Past			Present			Future			Disqualified			Ambiguity		
	Count	Fraction	Percentage	Count	Fraction	Percentage	Count	Fraction	Percentage	Count	Fraction	Percentage	Count	Fraction	Percentage
nifkad	25	24/36	66.67%	2	2/36	5.56%	3	3/36	8.33%	6	6/36	16.67%	0	0/36	0%
nifmak	21	20/36	55.56%	6	6/36	16.67%	1	1/36	2.78%	8	8/36	22.22%	0	0/36	0%
nivkav	23	22/36	61.11%	9	9/36	25%	1	1/36	2.78%	3	3/36	8.33%	0	0/36	0%
nivpa	14	14/36	38.89%	8	8/36	22.22%	0	0/36	0%	14	14/36	38.89%	0	0/36	0%
niskat	27	27/36	75%	9	9/36	25%	0	0/36	0%	0	0/36	0%	0	0/36	0%
nigmak	17	17/36	47.22%	16	16/36	44.44%	0	0/36	0%	3	3/36	8.33%	0	0/36	0%
nifak	18	18/36	50%	11	11/36	30.56%	3	3/36	8.33%	4	4/36	11.11%	0	0/36	0%
nidam	17	17/36	47.22%	17	17/36	47.22%	0	0/36	0%	2	2/36	5.56%	0	0/36	0%
nixnas	6	6/36	16.67%	25	25/36	69.44%	4	4/36	11.11%	1	1/36	2.78%	0	0/36	0%
nitsmad	12	12/36	33.33%	19	19/36	52.78%	0	0/36	0%	4	4/36	11.11%	1	1/36	2.78%
nivdam	19	19/36	52.78%	13	13/36	36.11%	0	0/36	0%	4	4/36	11.11%	0	0/36	0%
nignav	28	27/36	75%	2	2/36	5.56%	0	0/36	0%	6	6/36	16.67%	0	0/36	0%

Appendix F: B1 Past and Present (participle) tense syncretism for each of the verbs

Verbs	Past			Present			Future			Disqualified			Ambiguity		
	Count	Fraction	Percentage	Count	Fraction	Percentage	Count	Fraction	Percentage	Count	Fraction	Percentage	Count	Fraction	Percentage
kam	15	15/36	41.67%	16	16/36	44.44%	1	1/36	2.78%	3	3/36	8.33%	1	1/36	2.78%
kaʦ	10	10/36	27.78%	22	21/36	58.33%	0	0/36	0%	4	4/36	11.11%	0	0/36	0%
ba	9	9/36	25%	18	18/36	50%	8	8/36	22.22%	1	1/36	2.78%	0	0/36	0%
ʃaka	14	14/36	38.89%	18	18/36	50%	3	3/36	8.33%	1	1/36	2.78%	0	0/36	0%
ʃav	17	17/36	47.22%	7	7/36	19.44%	2	2/36	5.56%	10	10/36	27.78%	0	0/36	0%
baa	7	7/36	19.44%	19	19/36	52.78%	9	9/36	25%	1	1/36	2.78%	0	0/36	0%
gaʦ	5	5/36	13.89%	26	26/36	72.22%	0	0/36	0%	5	5/36	13.89%	0	0/36	0%
kaʋ	21	21/36	58.33%	11	11/36	30.56%	1	1/36	2.78%	3	3/36	8.33%	0	0/36	0%
zaz	10	10/36	27.78%	21	21/36	58.33%	1	1/36	2.78%	4	4/36	11.11%	0	0/36	0%
ʦaʦa	19	19/36	52.78%	16	16/36	44.44%	0	0/36	0%	1	1/36	2.78%	0	0/36	0%
laʃa	12	12/36	33.33%	20	19/36	52.78%	1	1/36	2.78%	2	2/36	5.56%	1	1/36	2.78%
nax	8	8/36	22.22%	23	23/36	63.89%	1	1/36	2.78%	4	4/36	11.11%	0	0/36	0%

Appendix G: B2 Past and Present (participle) tense syncretism for each of the participants

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	#16	#17	#18
Past	7	9	10	7	3	11	5	7	7	7	1	6	8	5	7	5	8	9
	7/12	9/12	10/12	7/12	3/12	11/12	5/12	7/12	7/12	7/12	1/12	6/12	8/12	5/12	7/12	5/12	8/12	9/12
	58.33 %	75%	83.33 %	58.33 %	25%	91.67 %	41.67 %	58.33 %	58.33 %	58.33 %	8.33%	50%	66.67 %	41.67 %	58.33 %	41.67 %	66.67 %	75%
Present	4	2	1	5	8	1	4	2	3	3	6	5	3	3	4	5	3	1
	4/12	2/12	1/12	5/12	8/12	1/12	4/12	2/12	3/12	3/12	6/12	5/12	3/12	3/12	4/12	5/12	3/12	1/12
	33.33 %	16.6 7%	8.33%	41.67 %	66.67 %	8.33%	33.33 %	16.67 %	25%	25%	50%	41.67 %	25%	25%	33.33 %	41.67 %	25%	8.33%
Future	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0
	0/12	0/12	0/12	0/12	0/12	0/12	0/12	2/12	0/12	0/12	2/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12
	0%	0%	0%	0%	0%	0%	0%	16.67 %	0%	0%	16.67 %	0%	0%	0%	0%	0%	0%	0%
Disqualified	0	1	1	0	1	0	3	1	2	2	3	1	1	4	1	2	1	2
	0/12	1/12	1/12	0/12	1/12	0/12	3/12	1/12	2/12	2/12	3/12	1/12	1/12	4/12	1/12	2/12	1/12	2/12
	0%	8.33 %	8.33%	0%	8.33%	0%	25%	8.33%	16.67 %	16.67 %	25%	8.33%	8.33%	33.33 %	8.33%	16.67 %	8.33%	16.67 %
Ambiguity	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12
	8.33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

	#19	#20	#21	#22	#23	#24	#25	#26	#27	#28	#29	#30	#31	#32	#33	#34	#35	#36
Past	6	4	4	6	9	6	3	3	6	6	2	9	10	6	7	7	4	7
	6/12	4/12	4/12	6/12	9/12	6/12	3/12	3/12	6/12	6/12	2/12	9/12	10/12	6/12	7/12	7/12	4/12	7/12
	50%	33.33%	33.33%	50%	75%	50%	25%	25%	50%	50%	16.67%	75%	83.33%	50%	58.33%	58.33%	33.33%	58.33%
Present	5	4	4	5	0	3	6	8	1	6	8	3	0	4	5	4	5	3
	5/12	4/12	4/12	5/12	0/12	4/12	6/12	8/12	1/12	6/12	8/12	3/12	0/12	4/12	5/12	4/12	5/12	5/12
	41.67%	33.33%	33.33%	41.67%	0%	33.33%	50%	66.67%	8.33%	50%	66.67%	25%	0%	33.33%	41.67%	33.33%	41.67%	41.67%
Future	0	3	0	0	0	1	2	0	0	0	0	0	0	2	0	0	0	0
	0/12	3/12	0/12	0/12	0/12	1/12	2/12	0/12	0/12	0/12	0/12	0/12	0/12	2/12	0/12	0/12	0/12	0/12
	0%	25%	0%	0%	0%	8.33%	16.67%	0%	0%	0%	0%	0%	0%	16.67%	0%	0%	0%	0%
Disqualified	1	1	4	1	3	2	1	1	5	0	2	0	2	0	0	1	3	2
	1/12	1/12	4/12	1/12	3/12	2/12	1/12	1/12	5/12	0/12	2/12	0/12	2/12	0/12	0/12	1/12	3/12	2/12
	8.33%	8.33%	33.33%	8.33%	25%	16.67%	8.33%	8.33%	41.67%	0%	16.67%	0%	16.67%	0%	0%	8.33%	25%	16.67%
Ambiguity	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Appendix H: B1 Past and Present (participle) tense syncretism for each of the participants

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	#16	#17	#18
Past	7	3	5	1	3	10	4	6	2	5	4	4	3	1	6	0	7	4
	7/12	3/12	5/12	1/12	3/12	10/12	4/12	6/12	2/12	5/12	4/12	4/12	3/12	1/12	6/12	0/12	7/12	4/12
	58.33%	25%	41.67%	8.33%	25%	83.33%	33%	50%	16.67%	41.67%	33.33%	33.33%	25%	8.33%	50%	0%	58.33%	33.33%
Present	2	6	7	11	9	0	6	5	9	7	3	8	8	6	4	10	5	7
	2/12	6/12	7/12	11/12	9/12	0/12	6/12	5/12	9/12	7/12	3/12	8/12	8/12	6/12	4/12	10/12	5/12	7/12
	16.67%	50%	58.33%	91.67%	75%	0%	50%	41.67%	75%	58.33%	25%	66.67%	66.67%	50%	33.33%	83.33%	41.67%	58.33%
Future	0	2	0	0	0	2	1	3	1	0	6	0	1	1	0	0	0	0
	0/12	2/12	0/12	0/12	0/12	2/12	1/12	3/12	1/12	0/12	6/12	0/12	1/12	1/12	0/12	0/12	0/12	0/12
	0%	16.67%	0%	0%	0%	16.67%	8.33%	25%	8.33%	0%	50%	0%	8.33%	8.33%	0%	0%	0%	0%
Disqualified	1	1	0	0	0	0	1	0	0	0	1	0	0	4	2	2	0	1
	1/12	1/12	0/12	0/12	0/12	0/12	1/12	0/12	0/12	0/12	1/12	0/12	0/12	4/12	2/12	2/12	0/12	1/12
	8.33%	8.33%	0%	0%	0%	0%	8.33%	0%	0%	0%	8.33%	0%	0%	33.33%	16.67%	16.67%	0%	8.33%
Ambiguity	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12
	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

	#19	#20	#21	#22	#23	#24	#25	#26	#27	#28	#29	#30	#31	#32	#33	#34	#35	#36
Past	4	1	2	5	8	2	2	4	7	4	2	8	6	6	2	5	2	2
	4/12	1/12	2/12	5/12	8/12	2/12	2/12	4/12	7/12	4/12	2/12	8/12	6/12	6/12	2/12	5/12	2/12	2/12
	33.33%	8.33%	16.67%	41.67%	66.67%	16.67%	16.67%	33.33%	58.33%	33.33%	16.67%	66.67%	50%	50%	16.67%	41.67%	16.67%	16.67%
Present	5	8	9	6	0	6	7	8	1	6	9	3	4	4	7	6	6	9
	5/12	8/12	9/12	6/12	0/12	6/12	7/12	8/12	1/12	6/12	9/12	3/12	4/12	4/12	7/12	6/12	6/12	9/12
	41.67%	66.67%	75%	50%	0%	50%	58.33%	66.67%	8.33%	50%	75%	25%	33.33%	33.33%	58.33%	50%	50%	75%
Future	0	2	0	0	1	3	2	0	2	0	0	0	1	1	2	0	0	0
	0/12	2/12	0/12	0/12	1/12	3/12	2/12	0/12	2/12	0/12	0/12	0/12	1/12	1/12	2/12	0/12	0/12	0/12
	0%	16.67%	0%	0%	8.33%	25%	16.67%	0%	16.67%	0%	0%	0%	8.33%	8.33%	16.67%	0%	0%	0%
Disqualified	3	1	1	1	3	1	1	0	2	1	1	1	1	1	1	1	4	1
	3/12	1/12	1/12	1/12	3/12	1/12	1/12	0/12	2/12	1/12	1/12	1/12	1/12	1/12	1/12	1/12	4/12	1/12
	25%	8.33%	8.33%	8.33%	25%	8.33%	8.33%	0%	16.67%	8.33%	8.33%	8.33%	8.33%	8.33%	8.33%	8.33%	33%	8.33%
Ambiguity	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	1/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12
	0%	0%	0%	0%	0%	0%	0%	0%	0%	8.33%	0%	0%	0%	0%	0%	0%	0%	0%

Appendix I: cases where the participants did not meet the requirements of the experiment and the answers were disqualified

The reason for disqualified	An example	
<p>Did not mention a time marker or a person marker that agrees with the verb</p>	<ul style="list-style-type: none"> ▪ he ʃava ʃiv sameax ▪ ani ʔats eleyxa ▪ tilmad ivkit ▪ tilbaf et ha-xultsa axʃav ▪ hu hayom nifak le-xug axarey beyt - ha-sefek ▪ maxax tenafek oti 	<ul style="list-style-type: none"> ▪ "היא שרה שיר שמח" ▪ "אני רץ אליך" ▪ "תלמד עברית" ▪ "תלבש את החולצה עכשיו" ▪ "הוא היום נשאר לחוג אחרי בית הספר" ▪ "מחר תנשק אותי"
<p>Inflected the verbs to other tense and person markers that agrees with the verb</p>	<ul style="list-style-type: none"> ▪ etmol ha-mesiba nigmeʔa maher 	<ul style="list-style-type: none"> ▪ "אתמול המסיבה נגמרה מהר" (נגמר)
<p>Compose a complex sentences with time marker or a person marker to the non-relevant verb</p>	<ul style="list-style-type: none"> ▪ etmol ʔaiti et yosi ʔats ba-tayelet ▪ ha-oxel kvax neʔkav, hu me-etmol ʃam. 	<ul style="list-style-type: none"> ▪ "אתמול ראיתי את יוסי רץ בטיילת" ▪ "האוכל כבר נרקב, הוא מאתמול שם"
<p>Compose a sentences with another irrelevant tense</p>	<ul style="list-style-type: none"> ▪ ani ba eleyxa maxax ▪ hu maxax ʃav eleynu ▪ at laʃa maxax 	<ul style="list-style-type: none"> ▪ "אני בא אליך מחר" ▪ "הוא מחר שב אלינו" ▪ "את לשה מחר"
<p>Mistake in reading or understanding the verb and turn it to a different verb or noun.</p>	<ul style="list-style-type: none"> ▪ ʃev axʃav! kelev tov ▪ ani axʃav olex la-ʔav ▪ maxax anaxnu niraʔed ▪ hu etmol nigev et ha-ʔitspa ▪ noax bana teyva etmol ▪ ata axʃav mexin laʃa 	<ul style="list-style-type: none"> ▪ "שב עכשיו! כלב טוב" ▪ "אני עכשיו הולך לרב" ▪ "מחר אנחנו נפרד" ▪ "הוא אתמול ניגב את הרצפה" (נגנב) ▪ "נח בנה תיבה אתמול" ▪ "אתה עכשיו מכין לשה"

Appendix J: Tense syncretism – Past and Present (participle) divided by telic and a telic verbs

Nifal & pa'al atelic verbs

Verbs	Past			Present			Future			Disqualified			Ambiguity		
niʃmak	21	21/36	58.33%	6	6/36	16.67%	1	1/36	2.78%	8	8/36	22.22%	0	0/36	0%
ʁats	10	10/36	27.78%	22	22/36	58.33%	0	0/36	0%	4	4/36	11.11%	0	0/36	0%
ʃava	14	14/36	38.89%	18	18/36	50%	3	3/36	8.3%	1	1/36	2.78%	0	0/36	0%
gav	5	5/36	13.89%	26	26/36	72.22%	0	0/36	0%	5	5/36	13.89%	0	0/36	0%
nifak	18	18/36	50%	11	11/36	30.56%	3	3/36	8.3%	4	4/36	11.11%	0	0/36	0%
nitsmad	12	12/36	33.33%	19	19/36	52.78%	0	0/36	0%	4	4/36	11.11%	1	1/36	3%
ʁav	21	21/36	58.33%	11	11/36	30.56%	1	1/36	2.78%	3	3/36	8.3%	0	0/36	0%
zaz	10	10/36	27.78%	21	21/36	58.33%	1	1/36	2.78%	4	4/36	11.11%	0	0/36	0%
lafa	12	12/36	33.33%	20	20/36	52.78%	1	1/36	2.78%	2	2/36	8.33%	1	1/36	3%
nax	8	8/36	22.22%	23	23/36	63.89%	1	1/36	2.78%	3	4/36	11.11%	1	0/36	0%

Pa'al atelic verbs

Verbs	Past			Present			Future			Disqualified			Ambiguity		
вѣтс	10	10/36	27.78%	22	21/36	58.33%	0	0/36	0%	4	4/36	11.11%	0	0/36	0%
ѣва	14	14/36	38.89%	18	18/36	50%	3	3/36	8.3%	1	1/36	2.78%	0	0/36	0%
гаѣ	5	5/36	13.89%	26	26/36	72.22%	0	0/36	0%	5	5/36	13.89%	0	0/36	0%
ѣв	21	21/36	58.33%	11	11/36	30.56%	1	1/36	2.78%	3	3/36	8.3%	0	0/36	0%
Zaz	10	10/36	27.78%	21	21/36	58.33%	1	1/36	2.78%	4	4/36	11.11%	0	0/36	0%
лаѣ	12	12/36	33.33%	20	19/36	52.78%	1	1/36	2.78%	2	2/36	8.33%	1	1/36	3%
Наѣ	8	8/36	22.22%	23	23/36	63.89%	1	1/36	2.78%	3	4/36	11.11%	1	0/36	0%

Nifal atelic verbs

Verbs	Past			Present			Future			Disqualified			Ambiguity		
нѣмаѣ	21	20/36	55.56%	6	6/36	16.67%	1	1/36	2.78%	8	8/36	22.22%	0	0/36	0%
нѣѣ	18	18/36	50%	11	11/36	30.56%	3	3/36	8.3%	4	4/36	11.11%	0	0/36	0%
нѣмад	12	12/36	33.33%	19	19/36	52.78%	0	0/36	0%	4	4/36	11.11%	1	1/36	3%

Nifal & pa'al telic verbs

Verbs	Past			Present			Future			Disqualified			Ambiguity		
nifkad	25	24/36	66.67%	2	2/36	5.56%	3	3/36	8.33%	6	6/36	16.67%	0	0/36	0%
kam	15	15/36	41.67%	16	16/36	44.44%	1	1/36	2.78%	3	3/36	8.33%	1	1/36	3%
ba	9	9/36	25%	18	18/36	50%	8	8/36	22.22%	1	1/36	2.78%	0	0/36	0%
nivkav	23	22/36	61.11%	9	9/36	25%	1	1/36	2.78%	3	3/36	8.33%	0	0/36	0%
jav	17	17/36	47.22%	7	7/36	19.44%	2	2/36	5.56%	10	10/36	27.78%	0	0/36	0%
nivpa	14	14/36	38.89%	8	8/36	22.22%	0	0/36	0%	14	14/36	38.89%	0	0/36	0%
baa	7	7/36	19.44%	19	19/36	52.78%	9	9/36	25%	1	1/36	2.78%	0	0/36	0%
nivbat	27	27/36	75%	9	9/36	25%	0	0/36	0%	0	0/36	0%	0	0/36	0%
nigmax	17	17/36	47.22%	16	16/36	44.44%	0	0/36	0%	3	3/36	8.33%	0	0/36	0%
nidam	17	17/36	47.22%	17	17/36	47.22%	0	0/36	0%	2	2/36	5.56%	0	0/36	0%
nixnas	6	6/36	16.67%	25	25/36	69.44%	4	4/36	11.11%	1	1/36	2.78%	0	0/36	0%
nivdam	19	19/36	52.78%	13	13/36	36.11%	0	0/36	0%	4	4/36	11.11%	0	0/36	0%
tsatsa	19	19/36	52.78%	16	16/36	44.44%	0	0/36	0%	1	1/36	2.78%	0	0/36	0%
nignav	28	27/36	75%	2	2/36	5.56%	0	0/36	0%	6	6/36	16.67%	0	0/36	0%

Pa'al telic verbs

Verbs	Past			Present			Future			Disqualified			Ambiguity		
kam	15	15/36	41.67%	16	16/36	44.44%	1	1/36	2.78%	3	3/36	8.33%	1	1/36	3%
ba	9	9/36	25%	18	18/36	50%	8	8/36	22.22%	1	1/36	2.78%	0	0/36	0%
jav	17	17/36	47.22%	7	7/36	19.44%	2	2/36	5.56%	10	10/36	27.78%	0	0/36	0%
baa	7	7/36	19.44%	19	19/36	52.78%	9	9/36	25%	1	1/36	2.78%	0	0/36	0%
tsatsa	19	19/36	52.78%	16	16/36	44.44%	0	0/36	0%	1	1/36	2.78%	0	0/36	0%

Nifal telic verbs

Verbs	Past			Present			Future			Disqualified			Ambiguity		
nifkad	25	24/36	66.67%	2	2/36	5.56%	3	3/36	8.33%	6	6/36	16.67%	0	0/36	0%
nivkav	23	22/36	61.11%	9	9/36	25%	1	1/36	2.78%	3	3/36	8.33%	0	0/36	0%
nivpa	14	14/36	38.89%	8	8/36	22.22%	0	0/36	0%	14	14/36	38.89%	0	0/36	0%
nisvat	27	27/36	75%	9	9/36	25%	0	0/36	0%	0	0/36	0%	0	0/36	0%
nigmaḅ	17	17/36	47.22%	16	16/36	44.44%	0	0/36	0%	3	3/36	8.33%	0	0/36	0%
nidam	17	17/36	47.22%	17	17/36	47.22%	0	0/36	0%	2	2/36	5.56%	0	0/36	0%
nixnas	6	6/36	16.67%	25	25/36	69.44%	4	4/36	11.11%	1	1/36	2.78%	0	0/36	0%
nivdam	19	19/36	52.78%	13	13/36	36.11%	0	0/36	0%	4	4/36	11.11%	0	0/36	0%
nignav	28	27/36	75%	2	2/36	5.56%	0	0/36	0%	6	6/36	16.67%	0	0/36	0%

Appendix k: Tense syncretism experiment #4 - Past and Present (participle) divided by telic and a telic verbs

Nifal & pa'al telic verbs

Verbs	Past			Present			Future			Disqualified			Ambiguity		
nifkad	26	33	78.79%	4	33	12.12%	2	33	6.06%	1	33	3.03%	0	33	0%
nivkav	24	33	72.73%	5	33	15.15%	1	33	3.03%	3	33	9.09%	0	33	0%
nivbat	27	33	81.82%	4	33	12.12%	0	33	0%	2	33	6.06%	0	33	0%
nigmar	17	33	51.52%	14	33	42.42%	2	33	6.06%	0	33	0%	0	33	0%
nidam	14	33	42.42%	14	33	42.42%	0	33	0%	5	33	15.15%	0	33	0%
nixnas	12	33	36.36%	16	33	48.48%	2	33	6.06%	3	33	9.09%	0	33	0%
nivdam	17	33	51.52%	9	33	27.27%	0	33	0%	7	33	21.21%	0	33	0%
nignav	23	33	69.70%	2	33	6.06%	0	33	0%	8	33	24.24%	0	33	0%
kam	11	33	33.33%	19	33	57.58%	0	33	0%	3	33	9.09%	0	33	0%
ba	6	33	18.18%	19	33	57.58%	4	33	12.12%	4	33	12.12%	0	33	0%
jav	18	33	54.55%	10	33	30.30%	3	33	9.09%	2	33	6.06%	0	33	0%
tam	6	33	18.18%	22	33	66.67%	0	33	0%	5	33	15.15%	0	33	0%
sam	11	33	33.33%	18	33	54.55%	1	33	3.03%	3	33	9.09%	0	33	0%
kama	15	33	45.45%	16	33	48.48%	0	33	0%	2	33	6.06%	0	33	0%
baa	10	33	30.30%	16	33	48.48%	5	33	15.15%	2	33	6.06%	0	33	0%

java	21	33	63.64%	10	33	30.30%	1	33	3.03%	1	33	3.03%	0	33	0%
tsatsa	13	33	39.39%	18	33	54.55%	2	33	6.06%	0	33	0%	0	33	0%
tama	14	33	42.42%	13	33	39.39%	1	33	3.03%	5	33	15.15%	0	33	0%
sama	9	33	27.27%	18	33	54.55%	0	33	0%	6	33	18.18%	0	33	0%

Nifal & pa'al atelic verbs

Verbs	Past			Present			Future			Disqualified			Ambiguity		
nifmak	13	33	39.39%	11	33	33.33%	1	33	3.03%	8	33	24.24%	0	33	0%
nifak	15	33	45.45%	14	33	42.42%	1	33	3.03%	3	33	9.09%	0	33	0%
nimna	9	33	27.27%	12	33	36.36%	2	33	6.06%	10	33	30.30%	0	33	0%
nizak	10	33	30.30%	11	33	33.33%	1	33	3.03%	11	33	33.33%	0	33	0%
nidbak	19	33	57.58%	10	33	30.30%	0	33	0%	4	33	12.12%	0	33	0%
nizkak	14	33	42.42%	12	33	36.36%	0	33	0%	7	33	21.21%	0	33	0%
nifan	8	33	24.24%	24	33	72.73%	0	33	0%	1	33	3.03%	0	33	0%
nitsmad	11	33	33.33%	18	33	54.55%	0	33	0%	4	33	12.12%	0	33	0%
kat̃s	9	33	27.27%	21	33	63.64%	3	33	9.09%	0	33	0%	0	33	0%
gak	4	33	12.12%	26	33	78.79%	2	33	6.06%	1	33	3.03%	0	33	0%
kav	17	33	51.52%	15	33	45.45%	1	33	3.03%	0	33	0%	0	33	0%
zaz	10	33	30.30%	19	33	57.58%	2	33	6.06%	2	33	6.06%	0	33	0%

пax	8	33	24.24%	23	33	69.70%	1	33	3.03%	1	33	3.03%	0	33	0%
кaтsа	12	33	36.36%	17	33	51.52%	2	33	6.06%	2	33	6.06%	0	33	0%
ђавa	16	33	48.48%	13	33	39.39%	2	33	6.06%	2	33	6.06%	0	33	0%
гавa	6	33	18.18%	24	33	72.73%	0	33	0%	3	33	9.09%	0	33	0%
кava	22	33	66.67%	8	33	24.24%	0	33	0%	3	33	9.09%	0	33	0%
zaza	10	33	30.30%	21	33	63.64%	0	33	0%	1	33	3.03%	1	33	3.03%
пaxa	9	33	27.27%	22	33	66.67%	1	33	3.03%	1	33	3.03%	0	33	0%

pa'al telic verbs

Verbs	Past			Present			Future			Disqualified			Ambiguity		
kam	11	33	33.33%	19	33	57.58%	0	33	0%	3	33	9.09%	0	0	0%
ba	6	33	18.18%	19	33	57.58%	4	33	12.12%	4	33	12.12%	0	0	0%
jav	18	33	54.55%	10	33	30.30%	3	33	9.09%	2	33	6.06%	0	0	0%
tam	6	33	18.18%	22	33	66.67%	0	33	0%	5	33	15.15%	0	0	0%
sam	11	33	33.33%	18	33	54.55%	1	33	3.03%	3	33	9.09%	0	0	0%
kama	15	33	45.45%	16	33	48.48%	0	33	0%	2	33	6.06%	0	0	0%
baa	10	33	30.30%	16	33	48.48%	5	33	15.15%	2	33	6.06%	0	0	0%
java	21	33	63.64%	10	33	30.30%	1	33	3.03%	1	33	3.03%	0	0	0%
tsatsa	13	33	39.39%	18	33	54.55%	2	33	6.06%	0	33	0%	0	0	0%
tama	14	33	42.42%	13	33	39.39%	1	33	3.03%	5	33	15.15%	0	0	0%
sama	10	33	30.30%	18	33	54.55%	0	33	0%	5	33	15.15%	0	0	0%

pa'al atelic verbs

Verbs	Past			Present			Future			Disqualified			Ambiguity		
вaтs	9	33	27.27%	21	33	63.64%	3	33	9.09%	0	33	0%	0	33	0%
gав	4	33	12.12%	26	33	78.79%	2	33	6.06%	1	33	3.03%	0	33	0%
вaв	17	33	51.52%	15	33	45.45%	1	33	3.03%	0	33	0%	0	33	0%
zaz	10	33	30.30%	19	33	57.58%	2	33	6.06%	2	33	6.06%	0	33	0%
пax	8	33	24.24%	23	33	69.70%	1	33	3.03%	1	33	3.03%	0	33	0%
вaтsа	12	33	36.36%	17	33	51.52%	2	33	6.06%	2	33	6.06%	0	33	0%
ђaвa	16	33	48.48%	13	33	39.39%	2	33	6.06%	2	33	6.06%	0	33	0%
gавa	6	33	18.18%	24	33	72.73%	0	33	0%	3	33	9.09%	0	33	0%
вaвa	22	33	66.67%	8	33	24.24%	0	33	0%	3	33	9.09%	0	33	0%
zaza	10	33	30.30%	21	33	63.64%	0	33	0%	1	33	3.03%	1	33	3.03%
пaxa	9	33	27.27%	22	33	66.67%	1	33	3.03%	1	33	3.03%	0	33	0%

Nifal telic verbs

Verbs	Past			Present			Future			Disqualified			Ambiguity		
nifrad	26	33	78.79%	4	33	12.12%	2	33	6.06%	1	33	3.03%	0	33	0%
nivkav	24	33	72.73%	5	33	15.15%	1	33	3.03%	3	33	9.09%	0	33	0%
niskat	27	33	81.82%	4	33	12.12%	0	33	0%	2	33	6.06%	0	33	0%
nigmaκ	17	33	51.52%	14	33	42.42%	2	33	6.06%	0	33	0%	0	33	0%
nidam	14	33	42.42%	14	33	42.42%	0	33	0%	5	33	15.15%	0	33	0%
nixnas	12	33	36.36%	16	33	48.48%	2	33	6.06%	3	33	9.09%	0	33	0%
nivdam	17	33	51.52%	9	33	27.27%	0	33	0%	7	33	21.21%	0	33	0%
nignav	23	33	69.70%	2	33	6.06%	0	33	0%	8	33	24.24%	0	33	0%

Nifal atelic verbs

Verbs	Past			Present			Future			Disqualified			Ambiguity		
nifmaκ	13	33	39.39%	11	33	33.333%	1	33	3.03%	8	33	24.24%	0	33	0%
nifav	15	33	45.45%	14	33	42.424%	1	33	3.03%	3	33	9.09%	0	33	0%
nimna	9	33	27.27%	12	33	36.364%	2	33	6.06%	10	33	30.30%	0	33	0%
nizav	10	33	30.30%	11	33	33.333%	1	33	3.03%	11	33	33.33%	0	33	0%
nidbak	19	33	57.58%	10	33	30.303%	0	33	0%	4	33	12.12%	0	33	0%
nizkak	14	33	42.42%	12	33	36.364%	0	33	0%	7	33	21.21%	0	33	0%

nifan	8	33	24.24%	24	33	72.727%	0	33	0%	1	33	3.03%	0	33	0%
nitsmad	11	33	33.33%	18	33	54.545%	0	33	0%	4	33	12.12%	0	33	0%

pa'al telic & atelic verbs

Verbs	Past			Present			Future			Disqualified			Ambiguity		
kam	11	33	33.33%	19	33	57.58%	0	33	0%	3	33	9.09%	0	33	0%
ba	6	33	18.18%	19	33	57.58%	4	33	12.12%	4	33	12.12%	0	33	0%
jav	18	33	54.55%	10	33	30.30%	3	33	9.09%	2	33	6.06%	0	33	0%
tam	6	33	18.18%	22	33	66.67%	0	33	0%	5	33	15.15%	0	33	0%
sam	11	33	33.33%	18	33	54.55%	1	33	3.03%	3	33	9.09%	0	33	0%
kama	15	33	45.45%	16	33	48.48%	0	33	0%	2	33	6.06%	0	33	0%
baa	10	33	30.30%	16	33	48.48%	5	33	15.15%	2	33	6.06%	0	33	0%
java	21	33	63.64%	10	33	30.30%	1	33	3.03%	1	33	3.03%	0	33	0%
tsatsa	13	33	39.39%	18	33	54.55%	2	33	6.06%	0	33	0%	0	33	0%
tama	14	33	42.42%	13	33	39.39%	1	33	3.03%	5	33	15.15%	0	33	0%
sama	10	33	30.30%	18	33	54.55%	0	33	0%	5	33	15.15%	0	33	0%
rats	9	33	27.27%	21	33	63.64%	3	33	9.09%	0	33	0%	0	33	0%
gar	4	33	12.12%	26	33	78.79%	2	33	6.06%	1	33	3.03%	0	33	0%

кав	17	33	51.52%	15	33	45.45%	1	33	3.03%	0	33	0%	0	33	0%
zaz	10	33	30.30%	19	33	57.58%	2	33	6.06%	2	33	6.06%	0	33	0%
nax	8	33	24.24%	23	33	69.70%	1	33	3.03%	1	33	3.03%	0	33	0%
кaтса	12	33	36.36%	17	33	51.52%	2	33	6.06%	2	33	6.06%	0	33	0%
јава	16	33	48.48%	13	33	39.39%	2	33	6.06%	2	33	6.06%	0	33	0%
гaкa	6	33	18.18%	24	33	72.73%	0	33	0%	3	33	9.09%	0	33	0%
кava	22	33	66.67%	8	33	24.24%	0	33	0%	3	33	9.09%	0	33	0%
zaza	10	33	30.30%	21	33	63.64%	0	33	0%	1	33	3.03%	1	33	3.03%
пaxa	9	33	27.27%	22	33	66.67%	1	33	3.03%	1	33	3.03%	0	33	0%

Nifal telic & atelic verbs

Verbs	Past			Present			Future			Disqualified			Ambiguity		
nifrad	26	33	78.79%	4	33	12.12%	2	33	6.06%	1	33	3.03%	0	33	0%
nivkav	24	33	72.73%	5	33	15.15%	1	33	3.03%	3	33	9.09%	0	33	0%
nisvat	27	33	81.82%	4	33	12.12%	0	33	0%	2	33	6.06%	0	33	0%
nigmaʁ	17	33	51.52%	14	33	42.42%	2	33	6.06%	0	33	0%	0	33	0%
nidam	14	33	42.42%	14	33	42.42%	0	33	0%	5	33	15.15%	0	33	0%
nixnas	12	33	36.36%	16	33	48.48%	2	33	6.06%	3	33	9.09%	0	33	0%
nivdam	17	33	51.52%	9	33	27.27%	0	33	0%	7	33	21.21%	0	33	0%
nignav	23	33	69.70%	2	33	6.06%	0	33	0%	8	33	24.24%	0	33	0%
nifmaʁ	13	33	39.39%	11	33	33.33%	1	33	3.03%	8	33	24.24%	0	33	0%
nifav	15	33	45.45%	14	33	42.42%	1	33	3.03%	3	33	9.09%	0	33	0%
nimna	9	33	27.27%	12	33	36.36%	2	33	6.06%	10	33	30.30%	0	33	0%
nizav	10	33	30.30%	11	33	33.33%	1	33	3.03%	11	33	33.33%	0	33	0%
nidbak	19	33	57.58%	10	33	30.30%	0	33	0%	4	33	12.12%	0	33	0%
nizkak	14	33	42.42%	12	33	36.36%	0	33	0%	7	33	21.21%	0	33	0%
nifan	8	33	24.24%	24	33	72.73%	0	33	0%	1	33	3.03%	0	33	0%
nitsmad	11	33	33.33%	18	33	54.55%	0	33	0%	4	33	12.12%	0	33	0%

Appendix L: 2nd MS and 3rd FM Combined Person and Gender syncretism for each verb

Verbs	2 nd MS			3 rd FM			Disqualified			Ambiguity		
tilmad	21	21/36	58.33	14	14/3	38.89%	1	1/36	2.78%	0	0/36	0%
tispor	25	25/36	69.44	10	10/3	27.78%	1	1/36	2.78%	0	0/36	0%
titkadem	26	26/36	72.22	8	8/36	22.22%	2	2/36	5.56%	0	0/36	0%
tiftok	28	28/36	77.78	5	5/36	13.89%	2	2/36	5.56%	1	1/36	2.78%
tilbaf	25	25/36	69.44	9	9/36	25%	1	1/36	2.78%	1	1/36	2.78%
texapes	25	25/36	69.44	10	10/3	27.78%	1	1/36	2.78%	0	0/36	0%
tedaber	21	21/36	58.33	12	3/36	8.33%	2	2/36	5.56%	1	1/36	2.78%
tenafek	23	23/36	63.89	11	11/3	30.56%	2	2/36	5.56%	0	0/36	0%
titkagef	21	21/36	58.33	15	15/3	41.67%	0	0/36	0%	0	0/36	0%
tafria	25	25/36	69.44	10	10/3	27.78%	0	0/36	0%	1	1/36	2.78%
tesaxek	21	21/36	58.33	11	11/3	30.56%	3	3/36	8.33%	1	1/36	2.78%
tifmor	29	29/36	80.56	6	6/36	16.67%	0	0/36	0%	1	1/36	2.78%

Appendix M: 2nd MS and 3rd FM Combined Person and Gender syncretism for each of the participants

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	#16	#17	#18
2nd MS	0/12	7/12	0/12	9/12	0/12	10/12	12/12	10/12	11/12	6/12	12/12	11/12	12/12	10/12	9/12	11/12	5/12	4/12
	0%	58.33%	0%	75%	0%	83.33%	100%	83.33%	91.67%	50%	100%	91.67%	100%	83.33%	75%	91.67%	41.67%	33.33%
3rd FM	12/12	5/12	0/12	3/12	0/12	1/12	0/12	1/12	1/12	6/12	0/12	0/12	0/12	1/12	3/12	1/12	7/12	8/12
	100%	41.67%	0%	25%	0%	8.33%	0%	8.33%	8.33%	50%	0%	0%	0%	8.33%	25%	8.33%	58.33%	66.67%
Disqualified	0/12	0/12	0/12	0/12	0/12	1/12	0/12	0/12	0/12	0/12	0/12	1/12	0/12	1/12	0/12	0/12	0/12	0/12
	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	8.33%	0%	8.33%	0%	0%	0%	0%
Ambiguity	0/12	0/12	0/12	0/12	0/12	0/12	0/12	1/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12
	0%	0%	0%	0%	0%	0%	0%	8.33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

	#19	#20	#21	#22	#23	#24	#25	#26	#27	#28	#29	#30	#31	#32	#33	#34	#35	#36
2nd MS	12/12	3/12	6/12	6/12	7/12	10/12	12/12	0/12	9/12	3/12	12/12	1/12	2/12	7/12	4/12	12/12	11/12	10/12
	100%	25%	50%	50%	58.33%	83.33%	100%	0%	75%	25%	100%	8.33%	16.67%	58.33%	33.33%	100%	91.67%	83.33%
3rd FM	0/12	9/12	5/12	6/12	5/12	0/12	0/12	12/12	3/12	4/12	0/12	11/12	10/12	5/12	1/12	0/12	0/12	1/12
	0%	75%	41.67%	50%	41.67%	0%	0%	100%	25%	33.33%	0%	91.67%	83.33%	41.67%	8.33%	0%	0%	8.33%
Disqualified	0/12	0/12	1/12	0/12	0/12	2/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	7/12	0/12	1/12	1/12
	0%	0%	8%	0%	0%	16.67%	0%	0%	0%	0%	0%	0%	0%	0%	58.33%	0%	8.33%	8.33%
Ambiguity	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	5/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/12
	0%	0%	0%	0%	0%	0%	0%	0%	0%	41.67%	0%	0%	0%	0%	0%	0%	0%	0%

Appendix N: 1st and 3rd Person syncretism for each of the verbs

Verbs	1 st			3 rd			Disqualified			Ambiguity		
yitkafeɣ	8	8/36	22.22%	28	28/36	77.78%	0	0/36	0%	0	0/36	0%
yifmoɣ	10	10/36	27.78%	26	26/36	72.22%	0	0/36	0%	0	0/36	0%
yirawed	9	9/36	25.00%	25	25/36	69.44%	2	2/36	5.56%	0	0/36	0%
yikanes	4	4/36	11.11%	31	31/36	86.11%	1	1/36	2.78%	0	0/36	0%
yiwkod	12	12/36	33.33%	24	24/36	66.67%	0	0/36	0%	0	0/36	0%
yawɣif	6	6/36	16.67%	28	28/36	77.78%	1	1/36	2.78%	1	1/36	2.78%
yitawgen	11	11/36	30.56%	25	25/36	69.44%	0	0/36	0%	0	0/36	0%
yilmad	9	9/36	25.0%	27	27/36	75%	0	0/36	0%	0	0/36	0%
yagia	10	10/36	27.78%	26	26/36	72.22%	0	0/36	0%	0	0/36	0%
yifɔf	11	11/36	30.56%	24	24/36	66.67%	1	1/36	2.78%	0	0/36	0%
yasbiɣ	15	15/36	41.67%	21	21/36	58.33%	0	0/36	0.00%	0	0/36	0%
yekabel	8	8/36	22.22%	27	27/36	75%	1	1/36	2.78%	0	0/36	0%

Appendix O: 1st and 3rd Person syncretism for each of the participants

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	#16	#17	#18
1st	0/1 2	3/1 2	3/1 2	0/1 2	2/12	7/12	4/12	1/12	4/12	1/12	0/1 2	0/1 2	12/ 12	0/1 2	0/1 2	1/12	2/12	1/12
	0%	25 %	25 %	0%	16.6 7%	58.3 3%	33.3 3%	8.33 %	33.3 3%	8.33 %	0%	0%	100 %	0%	0%	8.33 %	16.6 7%	8.33 %
3rd	12/ 12	9/1 2	9/1 2	12/ 12	10/1 2	5/12	8/12	11/1 2	8/12	11/1 2	12/ 12	12/ 12	0/1 2	12/ 12	12/ 12	11/1 2	10/1 2	11/1 2
	100 %	75 %	75 %	100 %	83.3 3%	41.6 7%	66.6 7%	91.6 7%	66.6 7%	91.6 7%	100 %	100 %	0%	100 %	100 %	91.6 7%	83.3 3%	91.6 7%
Disqualified	0/1 2	0/1 2	0/1 2	0/1 2	0/12	0/12	0/12	0/12	0/12	0/12	0/1 2	0/1 2	0/1 2	0/1 2	0/1 2	0/12	0/12	0/12
	0%	0 %	0 %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ambiguity	0/1 2	0/1 2	0/1 2	0/1 2	0/12	0/12	0/12	0/12	0/12	0/12	0/1 2	0/1 2	0/1 2	0/1 2	0/1 2	0/12	0/12	0/12
	0%	0 %	0 %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

	#19	#20	#21	#22	#23	#24	#25	#26	#27	#28	#29	#30	#31	#32	#33	#34	#35	#36
1st	11/12	6/12	4/1 2	1/12	0/1 2	12/ 12	0/1 2	2/12	6/12	0/1 2	7/12	8/12	0/1 2	1/12	1/12	4/12	9/12	0/12
	91.67 %	50%	33. 33 %	8.33 %	0%	100 %	0%	16.6 7%	50 %	0%	58.3 3%	66.6 7%	0%	8.33 %	8.33 %	33.3 3%	75%	0%
3rd	0/12	6/12	8/1 2	11/1 2	12/ 12	0/1 2	12/ 12	9/12	6/12	11/ 12	5/12	4/12	12/ 12	11/1 2	9/12	8/12	2/12	11/1 2
	0%	50%	66. 67 %	91.6 7%	100 %	0%	100 %	75%	50 %	91. 67 %	41.6 7%	33.3 3%	100 %	91.6 7%	75%	66.6 7%	16.6 7%	91.6 7%
Disqualified	1/12	0/12	0/1 2	0/12	0/1 2	0/1 2	0/1 2	1/12	0/12	0/1 2	0/12	0/12	0/1 2	0/12	2/12	0/12	1/12	1/12
	8.33 %	0%	0%	0%	0%	0%	0%	8.33 %	0%	0%	0%	0%	0%	0%	16.6 7%	0%	8.33 %	8.33 %
Ambiguity	0/12	0/12	0/1 2	0/12	0/1 2	0/1 2	0/1 2	0/12	0/12	1/1 2	0/12	0/12	0/1 2	0/12	0/12	0/12	0/12	0/12
	0%	0%	0%	0%	0%	0%	0%	0%	0%	8.3 3%	0%	0%	0%	0%	0%	0%	0%	0%

Appendix P: 1st and 3rd currently developing syncretism verb completion for each of the verb

Verbs	1 st			3 rd			Disqualified			Ambiguity		
bikeɤ	14	14/36	38.89%	16	16/36	44.44%	6	6/36	16.67%	0	0/36	0%
taxlik	18	18/36	50%	16	16/36	44.44%	2	2/36	5.56%	0	0/36	0%
ɤoked	17	17/36	47.22%	16	16/36	44.44%	3	3/36	8.33%	0	0/36	0%
titkafɤi	17	17/36	47.22%	16	16/36	44.44%	3	3/36	8.33%	0	0/36	0%
potxim	18	18/36	50%	17	17/36	47.22%	1	1/36	2.78%	0	0/36	0%
medabeɤ	22	22/36	61.11%	13	13/36	36.11%	1	1/36	2.78%	0	0/36	0%
bodkim	19	19/36	52.78%	16	16/36	44.44%	1	1/36	2.78%	0	0/36	0%
tixtevu	21	21/36	58.33%	13	13/36	36.11%	2	2/36	5.56%	0	0/36	0%
nevakef	21	21/36	58.33%	13	13/36	36.11%	2	2/36	5.56%	0	0/36	0%
taɤgia	20	20/36	55.56%	15	15/36	41.67%	1	1/36	2.78%	0	0/36	0%

Appendix Q: 1st and 3rd currently developing syncretism verb completion for each of the participants

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	#16	#17	#18
1st	10/10	10/10	1/10	0/10	5/10	0/10	3/10	10/10	7/10	0/10	8/10	0/10	0/10	9/10	10/10	10/10	10/10	0/10
	100%	100%	10%	0%	50%	0%	30%	100%	70%	0%	80%	0%	0%	90%	100%	100%	100%	0%
3rd	0/10	0/10	6/10	8/10	4/10	10/10	7/10	0/10	2/10	10/10	0/10	10/10	10/10	1/10	0/10	0/10	0/10	10/10
	0%	0%	60%	80%	40%	100%	70%	0%	20%	100%	0%	100%	100%	10%	0%	0%	0%	100%
Disqualified	0/10	0/10	3/10	2/10	1/10	0/10	0/10	0/10	1/10	0/10	2/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10
	0%	0%	30%	20%	10%	0%	0%	0%	10%	0%	20%	0%	0%	0%	0%	0%	0%	0%

	#19	#20	#21	#22	#23	#24	#25	#26	#27	#28	#29	#30	#31	#32	#33	#34	#35	#36
1st	0/10	0/10	0/10	9/10	7/10	2/10	0/10	1/10	10/10	10/10	0/10	0/10	10/10	10/10	8/10	10/10	8/10	9/10
	0%	0%	0%	90%	70%	20%	0%	10%	100%	100%	0%	0%	100%	100%	80%	100%	80%	90%
3rd	10/10	10/10	10/10	0/10	3/10	3/10	10/10	4/10	0/10	0/10	9/10	10/10	0/10	0/10	2/10	0/10	2/10	0/10
	100%	100%	100%	0%	30%	30%	100%	40%	0%	0%	90%	100%	0%	0%	20%	0%	20%	0%
Disqualified	0/10	0/10	0/10	0/10	0/10	5/10	0/10	5/10	0/10	0/10	1/10	0/10	0/10	0/10	0/10	0/10	0/10	1/10
	0%	0%	0%	10%	0%	50%	0%	50%	0%	0%	10%	0%	0%	0%	0%	0%	0%	10%

1st and 3rd currently developing syncretism- verb completion without no

Verbs	Third p.			First p.			Disqualified			Ambiguity		
bikeɤ	13	13/25	52%	9	9/25	36%	3	3/25	12%	0	0/25	0%
taxlik	13	13/25	52%	11	11/25	44%	1	3/25	12%	0	0/25	0%
ɤoked	12	12/25	48%	10	10/25	40%	3	3/25	12%	0	0/25	0%
titkafɤi	13	13/25	52%	11	11/25	44%	1	3/25	12%	0	0/25	0%
potxim	14	14/25	56%	11	11/25	44%	0	3/25	12%	0	0/25	0%
medabɤɤ	11	11/25	44%	14	14/25	56%	0	3/25	12%	0	0/25	0%
bodkim	13	13/25	52%	12	12/25	48%	0	3/25	12%	0	0/25	0%
tixtevu	10	10/25	40%	15	15/25	60%	0	3/25	12%	0	0/25	0%
nevakef	11	11/25	44%	13	13/25	52%	1	3/25	12%	0	0/25	0%
taɤgia	12	12/25	48%	13	13/25	52%	0	3/25	12%	0	0/25	0%

1st and 3rd currently developing syncretism verb completion with no insertion

Verbs	Third p.			First p.			Disqualified			Ambiguity		
bikev	3	3/11	27.27%	5	5/11	45.45%	3	3/11	27.27%	0	0/11	0%
taxlik	3	3/11	27.27%	7	7/11	63.64%	1	1/11	9.09%	0	0/11	0%
roked	4	4/11	36.36%	7	7/11	63.64%	0	0/11	0%	0	0/11	0%
titkafsi	3	3/11	27.27%	6	6/11	54.55%	2	2/11	18.18%	0	0/11	0%
potxim	3	3/11	27.27%	7	7/11	63.64%	1	1/11	9.09%	0	0/11	0%
medabev	2	2/11	18.18%	8	8/11	72.73%	1	1/11	9.09%	0	0/11	0%
bodkim	3	3/11	27.27%	7	7/11	63.64%	1	1/11	9.09%	0	0/11	0%
tixtevu	3	3/11	27.27%	6	6/11	54.55%	2	2/11	18.18%	0	0/11	0%
nevakef	2	2/11	18.18%	8	8/11	72.73%	1	1/11	9.09%	0	0/11	0%
taugia	3	3/11	27.27%	7	7/11	63.64%	1	1/11	9.09%	0	0/11	0%

Appendix R: The combined Person and Gender syncretism – 2nd MS and 3rd FM divided by the participant’s gender

Females participants			
Third p.	Second p.	Disqualified	Ambiguity
49/216	163/216	3/216	1/216
22.69%	75.46%	1.39%	0.46%

Males participants			
Third p.	Second p.	Disqualified	Ambiguity
72/216	127/216	12/216	5/216
33.33%	58.8%	5.56%	2.31%

References

- Aalberse, Suzanne Pauline. 2007. The typology of syncretisms and the status of feature structure. Verbal paradigms across Dutch dialects. *Morphology* 17:109-149.
- Anderson, Stephen R. 2011. An I-language View of Morphological 'Exceptionality': Comments on Corbett's Paper. In H. Wiese and H. Simon [eds.], *Expecting the Unexpected – Exceptions in Grammar*. Berlin, New York: Mouton, 127-134.
- Albright, Adam & Eric Fuß. 2012. Syncretism. In Jochen Trommer (ed.), *the Morphology and Phonology of Exponence*. Oxford: Oxford University Press, 236-287.
- Baerman, Matthew .2003. Typology and the formal modelling of syncretism. *Mediterranean Morphology Meeting 4*. University of Catania, September.
- Baerman, Matthew. 2004. Directionality and (UN) natural classes in syncretism. *Language* 80: 807-827.
- Baerman, Matthew; Dunstan Brown; & Greville G. Corbett. 2005. *The syntax-morphology interface: A study of syncretism*. Cambridge: Cambridge University Press.
- Bobaljik, Jonathan. 2001. Syncretism without paradigms: Remarks on Williams 1981, 1994. *Yearbook of Morphology*. 53-85.
- Carstairs, Andrew. 1984. Outlines of a constraint on syncretism. *Folia Linguistica* 18: 73-85.
- Carstairs-McCarthy, Andrew. 1998b. Comments on the paper by Noyer. In Steven G. Lapointe, Diane K. Brentari, and Patrick M. Farrell (eds.), *Morphology and its relation to phonology and syntax*. Stanford: CSLI Publications. 286–301.
- Greenberg, Joseph h. 1967. Some universals of grammar with particular reference to the order of meaningful elements. *Universals of language* .Joseph H. Greenberg (ed). Cambridge, MA: MIT Press, 73-113.

- Hansson, Gunnar. 1996. *Productive syncretism and morphological theory: a case study of North Sami inflectional morphology*. Berkeley: University of California, ms.
- Harley, H. 1994. Hug a tree: Deriving the morphosyntactic feature hierarchy. (eds). *Papers on phonology and morphology*. A. Carnie, H. Harley and T. Bures (eds): MIT, Cambridge. Department of Linguistics. Working Papers in Linguistics 21: 289 -320.
- Harley, H. & Ritter, E. 2002a. Person and number in pronouns: A feature-geometric analysis. *Language* 78: 482-526.
- Harley, H. and E. Ritter 2002. Structuring the Bundle: A Universal Morphosyntactic Feature Geometry. In H. Simons and H. Weise (eds). *Pronouns: Features and Representation*. Amsterdam: John Benjamins.23-39
- Harley, Heidi. 2008. "When is a syncretism more than a syncretism? Impoverishment, metasyncretism, and underspecification," in *Phi Theory: Phi-features across modules and interfaces*, edited by David Adger, Susana Bejar and Daniel Harbour. Oxford: OUP. 251-294.
- Jennifer Hay, Christopher Kennedy and Beth Levin. 1999. Scalar Structure Underlies Telicity in *'Degree Achievements'*. *Proceedings of Semantics and Linguistic Theory 9*, Cornell Linguistics Circle Publications
- Jones, Patrick Jackson .2009. *Accounting for arbitrary syncretism in the verbal system of Kinande*. Ms, MIT.
- Noyer, Robert Rolf. 1992. *Features, positions, and affixes in autonomous morphological structure*. Cambridge, MA: MIT dissertation.
- Müller, Gereon. 2005. A Distributed Morphology approach to syncretism in Russian noun inflection. *Proceedings of Formal Approaches to Slavic Linguistics 12*, ed. by Olga Arnaudova, Wayles Browne, Maria Luisa Rivero and Dejan Stojanović. Ann Arbor: Michigan Slavic Publications.
- Schwarzwald, Ora R. 2001. *Modern Hebrew*, München :Lincom Europa.

Schwarzwald, Ora R. 2002. *Studies in Hebrew Morphology*, Volume 3: the Hebrew syllable and morpheme; Hebrew morphophonemic processes; Roots and patterns. Tel Aviv: Open University.

- Stemberger, J., & MacWhinney, B. 1986. Frequency and the lexical storage of regularly inflected forms. *Memory and Cognition*, 14: 17-26.
- Stump, Gregory. 1993. On rules of referral. *Language* 69: 449-479.
- Stump, Gregory. 2001. *Inflectional morphology*. Cambridge: Cambridge University Press.
- Williams, Edwin. 1994. Remarks on lexical knowledge. *Lingua* 92:7-34.
- Wunderlich, Dieter. 2004. Forthcoming. Is there any need for the concept of directional syncretism? *Explorations in nominal inflection*, ed. by Lutz Gunkel, Gereon Müller and Gisela Zifonun. Berlin: Mouton de Gruyter.
- Zwicky, Arnold. 1985. How to describe inflection. *Berkeley Linguistics Society* 11:372-386.
- Zwicky, Arnold M. 1994. Morphological metageneralizations: morphology, phonology, and morphonology. Paper presented at the Kentucky Foreign Language Conference, University of Kentucky, April 1994.
- Zwicky, Arnold. 2000. *Describing syncretism: rules of referral after fifteen years*. Paper presented at the annual meeting of the Berkeley Linguistics Society, University of California, Berkeley.

תקציר

במערכת מורפולוגית נטייתית אידיאלית ישנה הציפייה שכל צורה בפרדיגמה תשרת ערך תכונתי אחד בלבד (גוף - ראשון / שני / שלישי, זמן - עבר / הווה / עתיד, מין - זכר/ נקבה ומספר - יחיד / רבים), אך בפועל אנו רואים בהרבה, אם לא בכל השפות הטבעיות, צורות המשרתות יותר מערך תכונתי אחד (Baerman, Brown and Corbett) (2005).

תופעה זאת, בה צורה אחת משרתת יותר מערך תכונתי אחד נקראת סינקרטיזם. Stump (1993) מבחין בין סוגי סינקרטיזם עפ"י האופן בו ערכי תכונות מתקשרים אל הצורה, כאשר הוא מתמקד בשניים עיקריים; - **(bidirectional or unidirectional) directional** ו- **symmetrical**. **Directional** כאשר ניתן לראות מהו ערך התכונתי המקורי השייך לצורה אותו הוא מכנה ה- **determinant** ומהו ערך התכונתי המתווסף לצורה אותו הוא מכנה ה- **depeded** ו- **symmetrical** כאשר שני ערכי התכונות מתחברים אל הצורה כסט אחד, ללא הבחנה כלשהי בערך תכונתי השייך לצורה ובערך תכונתי המתווסף לה. מטרת המחקר הנוכחי היא לבחון שלושה מקרי סינקרטיזם בעברית: סינקרטיזם הגוף (סינקרטיזם מתהווה) - גוף ראשון ושלישי, סינקרטיזם הזמן- עבר והווה וסינקרטיזם הגוף והמין- גוף שני זכר וגוף שלישי נקבה ואת האופן בו הדובר מאחסן בלקסיקון את אותן צורות סינקרטיות וערכי התכונות שלהן; האם כאשר הוא נחשף לצורה סינקרטית הוא מקשר אותה אל ערך תכונתי אחד באופן ישיר ורק לאחר מכן גם לשאר ערכי התכונות הקיימים בה (**directional**) או האם כאשר הוא נחשף לצורה סינקרטית הוא רואה את כל סט ערכי התכונות הקיימים בה (**symmetrical**).

כמו כן, המחקר בוחן תאוריות מסומנות והיררכיה של תכונות וערכי תכונות על מנת לקבל תמונה ברורה יותר לגבי היחסים בין התכונות וערכי התכונות של אותן צורות סינקרטיות.

במחקר זה נערכו שלושה ניסויים אשר בדקו את שלושת סוגי הסינקרטיזם על קבוצת נבדקים של 36 בני נוער בני 15 וניסוי נוסף שבדק את סינקרטיזם הזמן בלבד על קבוצת נבדקים של 33 בני נוער בני 15.

בניסוי הראשון, השני והרביעי, הנבדקים קיבלו רשימות של פעלים עבורם התבקשו לחבר משפטים תוך שימוש בכינוי גוף מתאים בעמדת נושא המשפט או שימוש באחת ממילות הזמן המתאימות- אתמול, עכשיו או מחר בכדי לציין את זמן הפעולה- עבר, הווה או עתיד.

בניסוי השלישי קיבלו הנבדקים משפטים עם פעלים בבניינים, בזמנים ובגופים שונים כאשר לכל אחד ממשפטים אלה, ניתן משפט מקביל בזמן עתיד ובעל הגוף מדובר(אני) בו הם התבקשו להשלים את הפועל החסר בהתאמה למשפט הנתון.

תוצאות הניסויים מצביעות בבירור על כך שאין סימטריות באופן שבו ערכי התכונות מתקשרות לצורות הסינקרטיות. עם זאת, לא תמיד ניתן להבחין באשר לתכונות או לערך התכונות המקושרים אל הצורה הסינקרטית באופן ישיר. כמו כן, לא תמיד ניתן להסביר את ה- directionality באמצעות תאוריות מסומנות והיררכיה של תכונות וערכי התכונות שלהם.

הממצאים מצביעים בעיקר על כך שמרבית המשתתפים, מלבד בודדים, לא הבחינו בכך שהצורות הסינקרטיות בעלות יותר מערך תכונות אחד וכן, גם רק במספר מצומצם של פעלים, דבר היכול בהחלט להצביע על כך שעבור הדוברים ישנו ערך תכונות אחד נגיש יותר לצורה הסינקרטית.

אוניברסיטת תל-אביב
הפקולטה למדעי הרוח ע"ש לסטר וסאלי אנטין
החוג לבלשנות

סינקרטיזם בעברית מודרנית

חיבור זה הוגש כעבודת גמר לקראת התואר
'מוסמך אוניברסיטה' (M.A.) באוניברסיטת תל-אביב

על ידי:
יפעת שטרן סבח

העבודה נעשתה בהנחיית:
פרופ' אותי בת-אל

אוקטובר 2016