

Tel-Aviv University

Lester and Sally Entin Faculty of the Humanities

Department of Linguistics

Idiom Storage and the Structure of the Lexicon

MA thesis submitted by

Hadar Klunover

Prepared under the guidance of

Prof. Tal Siloni

Prof. Julia Horvath

February 2012

Abstract

This¹ study is inspired by Horvath & Siloni's (2009a) corpus study concerning the storage of Hebrew idioms and the organization of the mental lexicon. Idioms are expressions characterized by conventionality and figuration. Even though it is clear that they are lexical representations, they are structured like phrases rather than like words, and this raises the question, what is their exact place and manner of storage. We conducted two experiments in which participants were taught invented idioms in Hebrew, based on real idioms in English and French. The idioms were of three types: headed by an unaccusative verb, headed by an adjectival passive, or headed by a verbal passive. After learning the idioms, the participants had to judge, for each idiom, how likely it seems that this idiom exists in its transitive version i.e. headed by the transitive counterpart of the original head. The results confirm our predictions and are in line with Horvath & Siloni's (2009a) findings about the distribution of the different diatheses in phrasal idioms: the tendency of verbal passive to share its idiomatic meanings with its transitive counterpart was found to be significantly higher than the tendencies of both the unaccusative and the adjectival passive to share their idiomatic meaning with their respective transitive counterparts. In other words, unique idioms i.e. diathesis-specific idioms, were more likely to be headed by either an adjectival passive or an unaccusative than by a verbal passive. The fact that the distribution of idioms is depended on the head diathesis, and that verbal passive was significantly less likely than the others to head unique idioms, confirms Horvath& Siloni's Head-Based Hypothesis, namely, that phrasal idioms are stored as subentries of their lexical head. At the same time it confirms the following assumptions as well: a) idioms are stored as linguistic knowledge. b) the mental lexicon contains specific predicates, i.e. words, as entries. If it contained only roots and idioms were stored as sub-entries of roots, idioms would have been found equally available in all the diatheses that the root allows. c) unaccusatives and adjectival passives are listed as entries in the lexicon, hence idioms can be stored as their sub-entries and can be unique idioms. Verbal passives are not listed in the lexicon but are derived post-

¹ The experiments are part of the BSF project No 2009269, (Pls Prof. Tal Siloni, Prof. Julia Horvath and Prof. Kenneth Wexler).

lexically d) since unaccusatives and adjectival passives are entries in the lexicon, it follows that the lexicon is an active component which involves derivation processes. These derivation processes need not be reactivated for each use, as the derived forms are already listed as entries; rather they are operative during the early development of language and are accessible later on when needed.

1. The mental lexicon

The '**modular view of the mind**' assumes that the mind is composed of different cognitive systems which are independent of one another but may interface with one another. Important adherents of this approach are Jerry Fodor (1983), Noam Chomsky (1995), Tanya Reinhart (2002), and others. Cognitive activity, in this approach, is not the result of general cognitive mechanisms, but of different specific mechanisms functioning independently that intercommunicate in certain ways. Importantly, this does not mean that each mechanism functions within a specific region of the brain: the function of each of the different mechanisms involves several different brain regions, as is attested by many neurolinguistical studies. The Modularity hypothesis has been receiving many reinforcements in the last decades. It can explain, for example, the "Savant" phenomenon – people who have clear cognitive deficiencies but at the same time show striking capacities in certain specific cognitive abilities, for example calculation or the ability to learn a foreign language (Smith & Tsimpli, 1995).

The human linguistic ability is assumed to be modular as well, i.e. comprising different, independently functioning systems with interfaces between them.

Theoretical models of the mental grammar, among which is the generative model, assume the existence of the following constituents in the linguistic system: a lexical component (system) i.e. the mental lexicon; a computational component, i.e. the syntax; a semantics component; and a component responsible for the physical aspect of the language – sound or sign. This modularity of linguistic function has indeed obtained significant reinforcement in the last half century of theoretical linguistics research. In this study I concentrate on the lexical component, namely, the mental lexicon, its structure, and its interface with the syntax. This study proposes additional evidence for the modularity of linguistic function, specifically making a statement about the lexicon-syntax interface and its unidirectionality.

In regards to this interface, the linguistic research is concerned with two principal questions. The first one is the Words vs. Roots question: what kind of entries make up the mental lexicon? Is it words (as was recently claimed by Horvath & Siloni (2009a)), or is it more basic elements such as roots – whether consonantal roots as in

Semitic languages (Arad, 2005; Doron 2003) or roots in the wider sense as in other languages (Borer, 2005; Marantz, 1997; Pytkäinen, 2002; Rachmand, 2006 and others). The second question pertains to the function of the mental lexicon: words often seem to derive from other words or from more basic units, for example, the Hebrew verb *hupal* ‘was caused to fall’ may derive from the transitive verb, *hipil* ‘caused to fall’, or maybe from the root: n.f.l. Is the mental lexicon, then, an active system, which contains derivation processes, or does it comprise only lists of underived (atomic) entries while the derivation processes occur in the syntax? Those who assume a root-based lexicon will support here the latter possibility.

Bat-El (1994), Bolozky (1978), Horvath (1981), and Ussishkin (1999) have argued, based on morphological evidence, that the basic unit of the lexicon is the word (and not the root). These studies show that the input to certain morphological processes is necessarily a word and not a root. Assuming that morphological processes are known to occur in the mental lexicon, they conclude that the mental lexicon must contain words. However, the assumption that morphological processes occur in the lexicon is no longer a consensus and recent models of the mental grammar conceive that the morpho-phonological "clothing" of the word is endowed to it only after the syntactic derivation. If so, that morphological processes take words as their inputs does not prove that words exist in the lexicon.

In this study, I focus on the thematic derivation of words, i.e. the derivation setting their semantic and syntactic valency (argument structure) as opposed to the morpho-phonological derivation. This may shed light on the above mentioned questions about the lexicon.

The structure of this study is as follows: in section 2.1 I introduce the empirical field of phrasal idioms and present the scientific literature dealing with their storage. Then, in section 2.2 I provide a review of the four verbal diatheses this research refers to. . In section 2.3 I explain why the investigation of idiom storage is relevant to the questions about the mental lexicon raised in section 1. At this point I introduce the head-based storage hypothesis, formed and first tested in Horvath & Siloni (2009a). In section 3 I describe Horvath & Siloni's study and its results and discuss their theoretical implications. In section 4 I present the first experiment which I had conducted and briefly discuss its results. In section 5 I present the second experiment and the modifications it involved. In section 6 I discuss the results of both experiments and finally, in section 7, I propose my conclusions from this study.

2. Idioms

2.1 Defining the domain of inquiry

An idiom is a fixed expression of which the meaning is unpredictable from the meanings of its units. According to Nunberg, Sag, & Wasow (1994), these expressions are characterized by a) conventional meaning b) figuration (i.e. metaphoric meaning) c) inflexibility of form and d) proverbiality (i.e. dealing with relevant social issues).

Horvath & Siloni (2009b) take **conventionality** and **figuration** to be the defining properties of these expressions. I will adopt this definition of idioms in this study. Conventionality and figuration distinguish idioms from proverbs. For example, expression (1a) is conventional and figurative, and is therefore an idiom, whereas (1b) is conventional but lacks figuration, and is therefore not an idiom, but rather a proverb.

(1a) ha-deše šel ha-šaḡen yarok yoter.

the-grass of the-neighbor green more

the neighbor's grass is greener

(metaphorical meaning: what the other person has, always seems better than ours)

(1b) niḡnas yayin - yaca sod.

Came-in wine came-out secret

Wine came in – secret came out

(meaning: when one drinks wine one tends to let out secrets.)

Idioms raise an interesting conflict. On the one hand, they are fixed expressions with an idiosyncratic meaning that cannot be predicted from the meanings of their constituents. Therefore, it is clear that they are stored as mental representations. On the other hand, they are structured like ordinary phrases in the language, and those are constantly produced by the computational system that constructs phrases and sentences, i.e. the syntactic component. This conflict leads to the question: So where exactly and how are idioms stored? Can we arrive at a model for idiom storage that

will reconcile their contrasting characteristics? The answer to this question will provide an insight to the structure and characteristics of the mental lexicon.

The most basic question about idiom storage is: are idioms stored as part of our linguistic knowledge – as is assumed by the linguistic approach, or, are they stored as other non-linguistic information, like historical or geographical facts – as is assumed by the non-linguistic approach? Since idiom knowledge involves assigning a meaning to a sequence of sounds, it seems to be part of the linguistic knowledge, and not merely an instance of general knowledge (Jackendoff, 1997). The linguistic approach is reinforced by the findings of Horvath & Siloni (2009a) which will be described in detail further on. Horvath & Siloni show that the storage of idioms is sensitive to grammatical differences, a fact which arises from this study as well.

The linguistic literature distinguishes between clausal idioms, which contain the structure of a clause/sentence, and phrasal idioms, which do not contain clausal material (e.g. fixed tense, questions, modals, negation), but only consist of a phrase (Horvath & Siloni, 2009a; Marantz, 1984; Nunberg, Sag, & Wasow, 1994). Clausal idioms (2), as opposed to phrasal idioms (3), are not flexible: adding a modifier (2b and 3b) or transforming them into passive (2c and 3c) weakens the idiomatic meaning.

- (2) a. People with glass houses shouldn't throw stones.
b. People with glass houses shouldn't throw (*any) stones.
c. * Stones shouldn't be thrown by people with glass houses.

- (3) a. break X's heart
b. break X's poor heart
c. X's broken heart

Under the linguistic approach to idiom storage, it was proposed that idioms are stored in the mental lexicon in the same way as words are, that is, as "big" lexical units ("big lexemes") (For example: Botelho & Cutler, 1993; Swinney & Cutler, 1979).

Other studies challenged this view, on the basis of evidence from idioms with a considerable amount of "compositionality" of meaning and flexibility of syntactic form (e.g Nunberg 1978, Gibbs, Nayak & Cutting 1989, Cacciari & Tabossi 1988).

Following Horvath & Siloni (2009a), I assume that clausal idioms are stored as "separate complex lexemes", and this explains their lack of inner formal flexibility.

In this study I focus on phrasal (and not clausal) idioms. I adopt Horvath and Siloni's (2009a) proposal (4) that phrasal idioms are stored as sub-entries of their lexical head, and will provide further support for it.

(4) The head based storage hypothesis

Phrasal idioms are stored as sub-entries of their lexical head.

Now, if idioms are stored under the lexical entry heading them, the next question to arise is: what is this lexical entry? Horvath & Siloni (2009a) suggest an answer to this question, which relies on the distribution of idioms across diatheses. Before presenting their stand, a few words on verbal diatheses are in order.

2.2 Diatheses – An Excursion.

Verb diatheses (or verb voices) are the different thematic realizations of the verb concept, such that each diathesis is a somewhat different instantiation of argument structure. The diatheses which are relevant to our hypothesis are: the transitive, the unaccusative, the verbal passive and the adjectival passive. In Hebrew and in many other languages, the various diatheses are morphologically marked. In English, in contrast, only the active-passive distinction is morphologically marked, hence, it is often impossible to identify the voice for an isolated verb form. However, other features of the diathesis make it detectable in the sentence, as we will see below.

Transitive verbs have an external argument in subject position, and at least one internal argument. Importantly, the transitive verb has an accusative case to assign. In Hebrew transitive verbs may take the templates: CaCaC (אָחַל), HiCCiC (הֶעִיז), and CiCeC(שִׁלֵּם). Some believe that transitive verbs are basic entries in the mental lexicon (e.g., Levin and Rappaport-Hovav 1995, Horvath and Siloni 2008, 2011, Reinhart 2002). Others derive it by addition of the external role in the syntax (Borer 2005, Rachmand 2006, Pylkkänen 2002, Alexiadou, Artemis & Elena Anagnostopoulou 2004 among others). . Examples of transitive verbs are: eat; show; see, and in Hebrew: אָחַל; הֶעִיז; רָאָה, respectively.

Verbal passives appear in Hebrew in the templates niCCaC (niḥtav), huCCaC (husbar) and CuCaC (šulam), while niCCaC may be ambiguous with the unaccusative diathesis. In English the passive is periphrastic, it is formed by an auxiliary followed by the verb passive form. Examples of verbal passives in English are: was eaten, was taken, was written. The subject of passive verbs is an internal argument. This is shown by internality tests that can determine whether an argument of the verb is originally internal or external. Two such tests for Hebrew are the Possessive Dative construction (Borer & Grodzinski 1986, Meltzer and Siloni to appear), and the Simple Inversion construction (Shlonsky 1997, Meltzer and Siloni to appear).

Possessive datives² denote possession in the loose sense, namely not only the owner but also the responsible for, etc (Horvath & Siloni 2008), as in the case of "le-dani" in example (1b) below. Crucially, possessive dative can modify only internal arguments. Hence it can modify the direct object of a transitive verb (1a). This construction can modify the subject of a verbal passive thus showing that it is an internal argument(1b). In contrast, using a possessive dative to modify other intransitive verbs, gives an ungrammatical construction (1c).

(1a) Ha-profesor daḥa le-Dani et ha-pgiša.

The-professor postponed to-Dani the meeting

The professor postponed Dani's meeting.

(1b) Ha-pgiša **nidḡeta** le-Dani.

The meeting was postponed to-Dani

Dani's meeting was postponed.

(1c)* ha-kelev šaḡav le-Dani.

The-dog lied down to-Dani.

The Simple Inversion or Strict VS Order Test: VS order (verb, then subject) is limited to verbs whose subject is an internal argument (2a vs. 2b). It is important that

² Note that the possessive dative test is not valid in the following cases: 1. The dative is a pronoun. This may give rise to other, non-possessive readings of the dative (e.g., reflexive or ethical, see Borer and Grodzinsky 1986:180–181, 185–188). 2. The subject is a pronominal NP or a proper noun. In these cases modification by possessors is not readily allowed. 3. the subject is an inalienable noun (as a body part or kinship term).

it be a "strict" VS order, namely that there be no element between the verb and the subject.³

(2a) **Huš'alu** šnei sfarim.

Were borrowed two books

Two books were borrowed.

(2b)***Šaxvu** šnei klavim.

Lied-down two dogs

The external role in verbal passives is not realized in the canonical subject position; it can be realized via a *by*-phrase. Importantly, it is always present at the level of interpretation, as can be proved by diagnostics detecting an implicit Agent, namely, addition of a *by*-phrase as in (3a) (e.g. Grimshaw 1990), an Agent-oriented adverb as in (3b) (e.g. Dubinsky & Simango 1996, Roeper, T. 1987a), and an Instrument as in (3c) (e.g. Embick 2004, Reinhart & Siloni 2005).

(3a) Ha-sefer **niytav** al yedey sofer mecuayan.

The-book was written by author excellent.

The book was written by an excellent author.

(3b) Ha-kereš **nusar** be-χavana.

The-board was cut on-purpose

The board was cut on purpose.

(3c) Ha-švil **suman** be-gir.

The-path was marked by chalk

The path was marked by chalk.

As for its derivation, it is widely argued that verbal passives are derived post-lexically (e.g. Wassow 1977, Baker, Johnson and Roberts 1989, Collins 2005 Horvath and Siloni 2008 among many others).

³ Note that the simple inversion in test is not valid in the following cases: 1. when the simple inversion is "triggered" by a preceding XP as in *Baxuc χiku šnei orχim*. In these cases the VS would work also with subjects which are external arguments (Doron and Shlonsky, 1992) 2. The subject is a proper name or a pronoun. In these cases the VS order is impossible regardless of the type of verb. Finally, this test is more efficient when the subject NP is indefinite.

Unergatives and Unaccusatives are both intransitive, one place verbs.

The subject of Unergatives is an external argument, as shown by the fact that it does not pass the tests of internality, namely it licenses neither a possessive dative nor strict VS order. Šaxav is an unegative verb, hence addition of a possessive dative and strict VS order result in ungrammaticality, as shown by (4c) and (5c) below, respectively.

The subject of **unaccusatives**, in contrast, is an internal argument, as shown by the fact that it licenses both a possessive dative (4a,b) and strict VS order (5a,b).

Possessive dative test:

(4a) Ha-mafte'aḡ **nafal** le-Dina.

The key fell down to Dina

Dina's key fell down.

(4b) Ha- maḡšev **hitkalkel** le-dina.

The computer broke down to-Dina

Dina's computer broke down.

(4c)*Ha-kelev **šaxav/kafac** le-Dina.

The-Dog lied down/jumped to Dina

Simple inversion test (strict VS order):

(5a) **Ne'ebdu** šnei mafteḡot.

Got-lost two keys

Two keys got lost.

(5b) **Hitkalkelu** šnei maḡševim.

Broke-down two computers

Two computers broke down.

(5c)***Kafcu/šaxvu** šnei klavim.

Jumped/lie down two dogs.

Unaccusative verbs do not have an external role, not even at the level of interpretation, unlike verbal passives. Hence they don't pass the tests that detect an implicit Agent:

(6a)*Ha-kerax **namas** be-χavana.

The-ice melted on purpose

(6b)*Ha-gešem **yarad** al yedey...

The-rain poured by...

(6c)*Ha-bakbuk **nistam** be-χatiχat ša'am.

The-bottle got blocked with a piece of cork

A well-known generalization regarding unaccusatives is that the transitive alternate has a Cause, not Agent, external role (see Reinhart 2002 among others). In the thematic structure of the verb concept, the Cause role refers to the participant that causes the action or event denoted by the verb, e.g. in 'The sun dried the clothes' 'the sun' realizes the Cause role. The Agent role is a private case of the Cause role, where the participant that causes the action or event is human, or has a mental state. Since a **Cause** can be interpreted also as an **Agent**, tests detecting an implicit agent are expected to detect an implicit external role in unaccusatives. The fact that they fail to detect it (6a,b,c) above, shows that it is entirely absent with unaccusatives. According to Reinhart (2002), unaccusative verbs are derived from their transitive counterpart, by "decausativization" – an operation reducing the +C role (Cause role) in the transitive form. Harley (2006), Pesetsky (1995:79-81), Pylkkänen (2008:82-132), Ramchand (2006:82-91) and others hold that the transitive verb is derived from the unaccusative alternate by syntactic causativization, adding an external theta role (Meltzer-Asscher and Siloni, to appear). Examples of unaccusatives are: break, open, fall, freeze. In Hebrew unaccusatives usually appear in the templates niCCaC (e.g. nišbar) and hitCaCeC (e.g. hitparek) which are indicative of a reduction in the thematic valency of the verb, which has taken place. Examples of unaccusatives in Hebrew are: Ala (went up), yarad (went down) nišbar (broke), yaca (went out).

The Adjectival passives describe a state or an outcome of an action rather than the action itself. In Hebrew they exist in the templates CaCuC (e.g. šamur), muCCaC (e.g.

mukpac) and meCuCaC (e.g mekumat). Except for the template CaCuC which is exclusively adjectival, the other templates are often ambiguous between verbal and adjectival passives. By placing this ambiguous form in a context that permits exclusively a verbal or an adjectival interpretation one can distinguish the verbal from the adjectival forms (Wasow 1977). A few such disambiguating contexts that apply in Hebrew are the following:

A copular construction in the future tense. This construction allows exclusively adjectival interpretation of the passive form following the copula. Thus *yihiye* in (7a) and (7b) must be interpreted as an adjective while (7c) is ungrammatical because 'kotev' is unambiguously a verb. (for the full discussion see Horvath & Siloni 2008).

(7a) Ha-sefer yihiye **me'anyen**.

The-book will be interesting

The book will be interesting.

(7b) Ha-bait yihiye **mešupac**.

The-house will be renovated

The house will be renovated.

(7c)*Ha-yeled yihiye kotev sipur.

The boy will be writing a story.

Addition of *al-yedey* ("by") phrase. Verbal passives always allow it (8a) while not all adjectives do (8b vs. 8c). So, if a form disallows *al-yedey* phrase, then it is adjectival.

(8a) ha-ner hudlak al-yedey em ha-mišpaḥa.

The-candle was lit by mother the-family

The candle was lit by the mother of the family.

(8b) ha-bayit yihiye **šamur** al-yedey šloša šomrim.

The-house will be guarded by three guards.

The house will be guarded by three guards.

(8c) *even ha-pina tihye munaxat ba-makom al-yedey 5 po'alim.

Stone the-corner will be laid in-place by five workers.

The raising verb nir'e (seem). This verb requires an AP complement (just like the English "seem" (Wasow 1977)) (9a). In Hebrew the word *nir'e* is ambiguous between the raising verb "seem" and the passive form of the verb "ra'a". In the latter case, the addition of an experiencer ("to X") is impossible, as shown in (9b).

(9a) ba-seret ha-agam nir'e **kafu**.

In+the-movie the-lake seems frozen

In the movie, the lake seems frozen.

(9b) ba-seret ha-yeled nir'e (*li) menutax.

In+the-movie the-boy is seen operated.

The subject of Adjectival passives is an external argument as it behaves on a par with the subject of unergatives, when put to the possessive dative test (10). Examples of adjectival passives are: fallen, beaten, drunk. In Hebrew: muke (beaten), šatuy (drunk) mezoħam (contaminated or polluted).

(10) *ha-mayim **kfu-im** le-Dan.

The-water frozen to-Dan

2.3 The nature of lexical entries: Horvath & Siloni 2009a

2.3.1 The relevance of diatheses distribution

Consider the verb phrase idioms. Since an idiom may exist in each of the different diatheses/voices of the verb (e.g transitive, unaccusative, verbal passive, adjectival passive), which form of the verb makes the lexical entry under which the idiom is stored? For example, for the Hebrew idiom '*yaca mi-da'ato*' ("lost his mind"), is each version of the idiom - (5a) and (5b) - stored under the specific verb form specified by diathesis, that heads it (*hoci*; *yaca*)? Or rather, the lexical entry is an abstract verbal representation, unspecified for diathesis, such as a root (א.צ.י), and the idiom is stored

under this entry and can be realized in any of the verbal diatheses permitted by the root?

(5a) yaca (UNACC) mi-da'ato

(5b) hoci (TRANS) et X mi-da'ato

If the idiom is stored as a sub-entry of the root (of the relevant verb), we would expect this idiom to be available in all of the different diatheses of the verb, as the root represents all of them. The implication of this would be that the lexicon must include roots as entries. If, by contrast, the entries in the lexicon are words rather than roots, then the lexical entry under which the idiom is stored is the actual form heading the idiom. In this case we can expect some idioms to be listed only under certain realizations (diatheses) of the verb and not others. We would expect that an idiom be listed in the lexicon only if its verbal head is an entry in the lexicon, which might not be always the case. If this verbal head is derived post-lexically and is not an entry in the lexicon, we would expect that the whole idiom not be listed in the lexicon, and hence, not be specific or unique to its head diathesis, since it cannot be listed under it. The implication of this finding would be that the lexicon must include words. The two alternatives of the **head-based storage hypothesis** are summarized in (6) below.

(6) The head based storage hypothesis: words or roots?

- a. idioms are stored as subentries of the predicate (the word) which is their head.
- b. idioms are stored as subentries of the root which represents their head in the mental lexicon.

3. Testing the head-based hypothesis: Horvath and Siloni (2009a)

In their pioneering corpus study designed to test the above predictions concerning the storage of idioms and the structure of the mental lexicon, Horvath and Siloni (2009a) investigated the distribution of four different verb diatheses in phrasal idioms in Hebrew. The selected diatheses were: transitive, verbal passive, unaccusative and adjectival passive. Since all the latter three are claimed to have derivational relations with the transitive, it was interesting to find out, in what cases these diatheses share the idiomatic meaning of the verb.

Scanning seven idiom dictionaries and running complementary internet searches, they looked for cases of **unique idioms**, as defined in (7) below.

- (7) a. An idiom headed by a predicate of the diatheses: unaccusative, verbal passive or adjectival passive, is defined as a unique idiom, if the relevant predicate has a corresponding transitive realization, but this transitive lacks the idiomatic meaning.
- b. An idiom headed by a transitive verb is considered unique if the relevant verb has a corresponding unaccusative realization, but this unaccusative lacks the idiomatic meaning.

After sampling 60 predicates of each type, the researchers counted for each type, how many of the 60 participated in a unique idiom. The results are presented in Table 1.

Table 1. Results of the corpus study by Horvath and Siloni (2009a)

Verbal Passives	Unaccusatives	Transitives	Adjectival Passives
0/60	21/60	23/60	13/60

Out of the 60 verbal passive predicates, none participated in a unique idiom. The difference between this result and the number of predicates participating in unique idioms in each of the other diatheses (unaccusatives, transitives, adjectival passives) was statistically significant ($\chi^2=23.09$ $p<0.001$, $\chi^2=26.03$ $p<0.001$, $\chi^2=12.42$ $p=0.0004$ respectively). The differences between the numbers of unaccusatives, transitives and adjectival passives that participated in unique idioms were not significant ($\chi^2(2)=4.313$, $p=0.12$).

These results lead to several important conclusions with regard to the questions discussed above. First, the fact that the distribution of idioms is sensitive to the diathesis of the head suggests that idioms are stored as linguistic knowledge. Otherwise, the information about the diathesis would be irrelevant. Moreover, the mere existence of (many) unique idioms attests against the "root-lexicon" claim: as mentioned above, if idioms were listed under a root entry, we would expect to find all idioms in all diatheses.

Let us now see how we can explain the finding that verbal passives, as opposed to the other three diatheses, did not participate in any unique idioms, given a word-based lexicon. If transitive verbs, unaccusative verbs, and adjectival passives are entries listed in the mental lexicon, then it follows that an idiom may be listed uniquely under one of them but not under the other, resulting in unique idioms. Further, if the verbal passive is not produced and represented in the lexicon, it cannot head unique idioms at all, because there is no lexical entry whose sub-entries they could be. Indeed, in the linguistic literature there is a consensus on the assumption that the verbal passive is not represented in the lexicon but is produced post-lexically (Baker, Johnson & Roberts, 1989; Collins, 2005; Horvath & Siloni, 2008, Meltzer, to appear). As for the other types of predicates, it is still debated where they are produced, but many assume that transitives are lexical entries which can be input for lexical derivation processes (Horvath & Siloni, to appear; Reinhart, 2002), and that unaccusatives (Chierchia, 2004; Horvath & Siloni, to appear; Levin & Rappaport, 1995; Reinhart 2002) and adjectival passives (Horvath & Siloni, 2008; Levin & Rappaport, 1986; Meltzer, to appear) are derived necessarily in the lexicon. The findings of Horvath and Siloni's corpus study reinforce this claim. Unless unaccusatives, transitives, and adjectival passives were listed as entries in the lexicon, they would not be involved in unique idioms, as is the case with the verbal passives. Also, the fact that idioms can be stored as their sub-entries means that these verbal forms exist as direct entries in the lexicon rather than being repeatedly derived for each use. Their relation to the input out of which they are derived is represented as a lexical rule that captures the methodic relations between the diatheses, but is not reactivated over and over again.

To summarize, Horvath & Siloni's findings support the head-based storage hypothesis (6a), and at the same time reinforce the following claims:

1. Idioms are stored as linguistic knowledge.

2. Transitives, unaccusatives, and adjectival passives are entries in the mental lexicon.
3. Verbal passive is derived post-lexically and is not an entry in the lexicon.
4. The lexicon is an active component involving derivation processes.

In this study I examine the idiom storage hypothesis by conducting two psycholinguistic experiments, where the second one was designed to be a methodologically improved version of the first one. These studies are described in the following section.

4. Psychological reality of idiom distribution

This study examines the psycholinguistic reality of the storage procedure of phrasal idioms. In two successive experiments, speakers were taught invented phrasal idioms in Hebrew, formed on the basis of existing idioms in other languages. Each of these idioms was headed either by an unaccusative, a verbal passive, or an adjectival passive. After learning and assimilating these new idioms, the participants were presented with each idiom again and were asked how likely it seemed to them that the corresponding transitive version of the idiom exists (in Hebrew). In this way, we examined for each idiom how much it was conceived as a unique idiom. The research question was how the diathesis heading the idiom influenced speakers' perception as to the existence of a transitive version of this idiom (i.e. the corresponding idiom headed by a transitive).

Since we assume that an idiom can be unique to its head diathesis only if this diathesis is an entry in the lexicon, and that verbal passives are not entries in the lexicon, while the other 2 diatheses are, we predicted that idioms headed by a verbal passive will tend not to be (conceived as) unique to this diathesis but rather to share their idiomatic meaning with the transitive.

In both experiments the results were as predicted: the idioms headed by a verbal passive were judged as more likely to exist in their transitive version than the idioms headed either by an unaccusative or an adjectival passive, and hence got a significantly higher score than the latter two idiom types. The second experiment was designed to improve the methods of the first one, and as expected, the results were replicated.

4.1 Experiment 1

4.1.1 Method

Participants:

30 monolingual native speakers of Hebrew, all of them linguistics graduate students in Tel Aviv University, in their twenties and thirties.

Materials:

9 phrasal idioms were composed, of which 3 were headed by a verbal passive, another 3 were headed by an unaccusative and the remaining 3, by an adjectival passive. In selecting the lexical heads, we used the following diagnostics to make sure that each head is of the required diathesis:

- Unaccusatives (vs. unergatives): (i) passed tests diagnosing internal arguments, that is, the "possessive dative test" (Borer & Grodzinski 1986, Meltzer and Siloni to appear) and the "simple inversion test" (Shlonsky 1997, Meltzer and Siloni to appear). (ii) were shown to have a transitive alternate with a [+c] role (Reinhart 2002, to appear).
- Unaccusatives (vs. verbal passives): passed "the instrument test", which detects an implicit Agent, present in verbal passives but not in unaccusatives (Siloni, 2002; Reinhart & Siloni, 2005).
- There was no need for diagnostics distinguishing verbal passives from adjectival passives, as we deliberately used only adjectival passives of the form CaCuC, which in Hebrew is reserved exclusively for adjectival passives (for the full item list see Appendix 1).

All idioms were formed by us on the basis of existing idioms in French and English which we modified according to the experimental needs. All idioms were made sure to meet the defining criteria of conventionality and figuration. For each idiom we made sure that the transitive version is possible semantically and pragmatically. For each idiom we formed a concise explanation of its meaning, and a matching example of usage.

Table 2. Items for Experiment 1 – examples for each type of idioms

V diathesis	Idiom+literal meaning	Meaning	Ex. Of usage	Original idiom
Unaccusative	Yaca im niḥoaḥ vradim	Ended up looking innocent	<i>The accusation against you are serious, but we will get you a good lawyer and you will come out smelling like a rose.</i>	Came out smelling like a rose
Verbal passive	Zupat be-ota mivrešet	Had the same characteristics	<i>If you didn't like the show, then he probably wouldn't like it either – after all you were both tarred with</i>	Tarred with the same brush

			<i>the same brush</i>	
Adjectival passive	Atuf ad ha-tši'iot	Dressed up elegantly	<i>Yossi's mother always keeps a respectable appearance. She comes all dressed to the nines even to maintenance meetings.</i>	Dressed to the nines

:

3 forms were used: Form I contained a list of the 9 idioms, each accompanied by its short explanation and an example of usage in a context. The idioms were presented on the list in a semi-random order, rather than grouped by the type of verbs heading them. Form II contained 9 completion items, one for each idiom, where only the beginning of the idiom appears and the rest of it is missing. The participants were required to fill the missing parts. The purpose of this form was to indicate how well the idioms were assimilated by the participants, and to make the participants go over the list once again and thus further practice it. The missing part of the idiom was always the second part and never the head. This was in order that the participant be exposed to the precise word heading the idiom, and would assimilate it without errors, this word being critical to the research question.

Form III consisted of the "target questionnaire", destined to provide the relevant data for the research question. It contained a list of the idioms that were learnt. For each idiom there was a question: 'You have learnt the idiom X. How likely (1-5) does it seem to you that the following idiom exists as well?' and the transitive version of the idiom, i.e. the same idiom headed by the transitive counterpart of the head predicate, immediately followed. For example, according to the 3 idioms in table 2 above, the transitive versions were the following (respectively):

1. Hoci'u oto im niyoay vradim

Got-out-IMP him with smell roses

Got him out smelling like a rose

2. Ziptu oto be-ota mivrešet

Tarred-IMP him with the same brush

Tarred him with the same brush

3. Atfu oto ad ha-tši'iot

Wrapped-IMP him to the nines

Dressed him to the nines

The participants were asked to rate the likelihood on a 1-5 scale where 1 represented 'least likely' and 5 – 'most likely'.

In addition to the three forms, we also prepared a plain list of the idioms, in a semi-random order, without any interpretations or examples.

Procedure:

The teaching method was uniform for all participants. First, the plain list of idioms was handed out to the participants. Next, the idioms were introduced to the class by being read aloud by me, out of Form I, each idiom along with its meaning and example of usage. It was verified with the class that all the idioms were understood. At the end of this session, the same Form I (form #1) was handed out to the participants in order to facilitate additional exposure to the idioms in the meantime between the 2 sessions. After 2-3 days, I returned to the same class. The idioms were reviewed with the class by reading them aloud again, one by one, along with their meanings. Then, Form II was handed out to the participants. This form contained the completion task. When finished filling out Form II, the participants received Form III containing the target questionnaire, where they had to rate on an ordinal scale, the likelihood that the transitive version of the idioms existed. On the basis of these data the results were figured.

4.1.2 Results

For each participant, we summed up the scores of every three idioms headed by the same diathesis, namely, unaccusative, verbal passive, or adjectival passive, creating 3 scores for each participant. We then summed up the scores of each diathesis over all 30 participants. The results are depicted in table 3.

Table 3. Results of Experiment 1- sum score of each diathesis

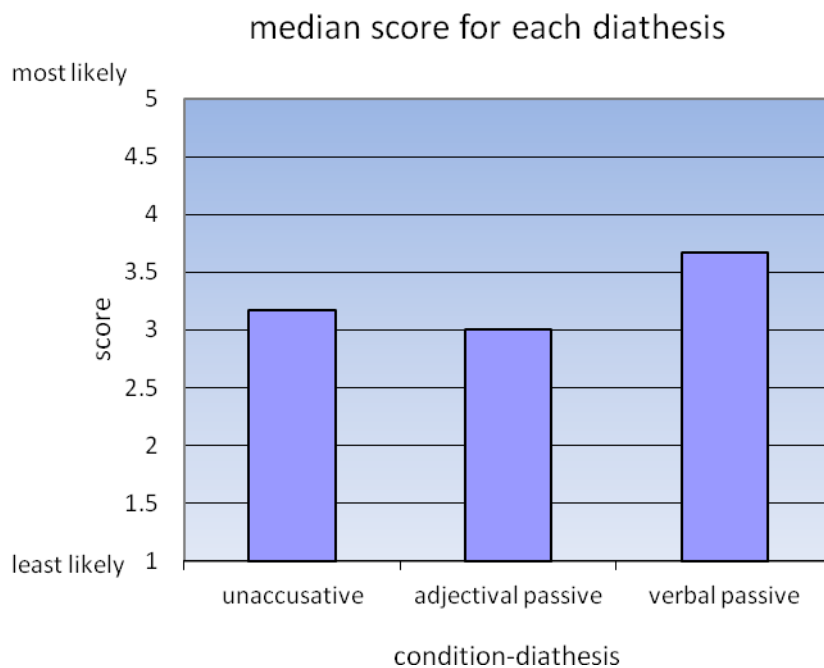
Diathesis	Unaccusative	Adjectival passive	Verbal passive
Score	294	263	326

As can be seen above, the verbal passives scored higher than the adjectival passives and the unaccusatives.

In addition, we calculated for each participant the mean score of every three idioms headed by the same diathesis, again creating 3 scores (now based on the means) for each participant: one for verbal passives, one for adjectival passives and one for unaccusatives. Each diathesis now had its own distribution of scores over the 30 participants. We analyzed the 3 distributions for statistical measures and compared between them. The results are depicted in charts1 and 2.

Each mean/median score represents the likelihood that the relevant diathesis shares the idiomatic meaning with its transitive counterpart. In other words, the higher the score, the more likely it is that the diathesis shares the idiomatic meaning with its transitive counterpart. The lower the score, the less likely it is that the diathesis shares the idiomatic meaning with its transitive counterpart, and the more likely it is that speakers see idiomatic meanings as unique to this diathesis.

Chart 1- median scores - each diathesis was rated regarding the question: How likely is it that the diathesis shares the idiomatic meaning with the transitive?

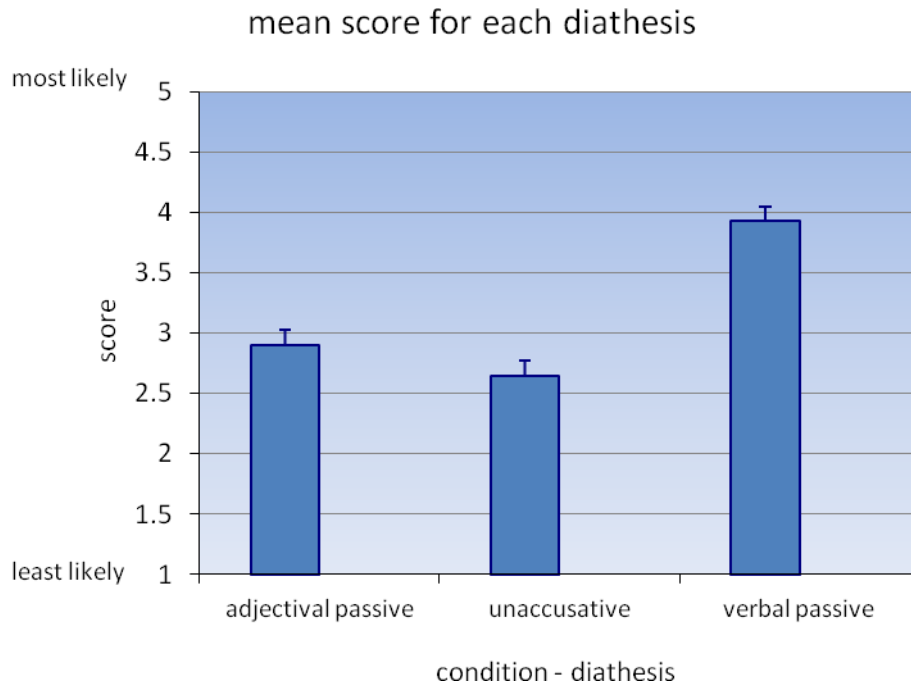


Since we used an ordinal rather than an interval scale, which might be incompatible with the basic assumptions required for t test, we performed two Wilcoxon signed-ranks tests with normal approximation. The difference between the verbal passives (med=3.67 intq=1.59) and the unaccusatives (med=3.17 intq. interval=0.92) was significant ($z=2.11$ $p=0.02$ one-tailed) and the difference between the verbal passives and the adjectival passives (med=3 intq=1.26) was significant as well ($z=3.14$ $p=0.001$ one-tailed).⁴ The difference between the unaccusatives and the adjectival passives was not significant, according to an additional Wilcoxon test ($z=1.63$ $p=0.1$ two-tailed). This means that the verbal passive is more likely to share idiomatic meanings with its transitive counterpart than both the unaccusative and the adjectival passive. The two latter types have not been found significantly different from each other in their likelihood to share idiomatic meanings with their transitive counterparts or to head unique idioms.

In addition, using a single-sample t test, we examined the difference between the mean score of each diathesis and the hypothetical mean 3, which represents "chance distribution". That is, if the participants answered the questionnaire arbitrarily having no criterion to base their choices on, their expected mean score (for each diathesis) would be 3, since this value is the middle of the response scale. We found that the unaccusative mean and the adjectival passive mean were not significantly different from 3 ($t(29)= 1.63$ $p=0.11$ two-tailed and $t(29)= 0.53$ $p=0.6$ two-tailed, respectively), which means, that they could be the outcome of chance distribution. We also found that the verbal passive mean was significantly higher than 3 ($t(29)=3.45$, $p<0.001$ one-tailed), which rules out the possibility of chance distribution on this diathesis. The mean scores of the three diatheses are shown in chart 2 below.

⁴The same results were achieved also with paired t-tests: the difference between verbal passives ($m=3.62$, $sd=0.97$) and unaccusatives ($m=3.27$, $sd=0.88$) was significant ($t(29) =2.24$ $p= 0.03$ one-tailed) and the difference between verbal passives and adjectival passives ($m=2.92$, $sd=0.79$) was significant as well ($t(29)= 4.09$ $p<0.001$ one-tailed). The difference between unaccusatives and adjectival passives was not significant ($t(29)=1.94$ $p=0.06$ two-tailed).

Chart 2 - mean scores - each diathesis was rated regarding the question: How likely is it that the diathesis shares the idiomatic meaning with the transitive?



4.2. Intermediate Discussion

The results of the first experiment are in line with the predictions. The results suggest a conceived difference between idioms headed by a verbal passive and idioms headed by either an unaccusative or an adjectival passive. The verbal passive idioms seem (to speakers) more likely to exist in the transitive version than the unaccusative idioms and the adjectival passive idioms. In other words, the verbal passive as a diathesis seems more likely to share its idiomatic meanings with the relevant transitive than the unaccusative and adjectival passive diatheses.

5. Experiment 2

The purpose of the second experiment was to replicate the results of the first one, while improving the methodology by some important modifications:

5.1. Method

Participants:

35 monolingual native speakers of Hebrew, graduate students in Tel Aviv University and Tel Aviv-Yaffo Academic College, most of them in their twenties and thirties.

Materials

Twelve phrase idioms rather than 9, were newly formed, 4 items for each diathesis, thereby enlarging the set of items and making the results more valid.

The idioms were formed this time on the basis of existing idioms in French only, in order to better ensure unfamiliarity of the idioms to the participants

In choosing the stimuli, we used the same diagnostics as in Experiment 1.

As in Experiment 1, each idiom was assigned a concise definition explaining its meaning and an example of the way it is used. Table 4 shows an example of the three types of idioms in Hebrew that were used and that are based on French idioms.

Table 4. Items for Experiment 2 – examples for each type of idioms

Diathesis	Idiom + Literal meaning	Meaning	Example of Usage	Original idiom in French
Unaccusative	Yaca im snapir be-yado Came out with a fin in his hand	Ended up with nothing of what was expected	The political candidate invested in a large, grandiose campaign, but eventually, because of sloppy administration, he came out with a fin in his hand: not even passing electoral threshold.	finir en queue de poisson
Verbal passive	Kusa be-kemaç Was covered with flour	Was cheated	When that deal was offered to him by the sales agent, Danny didn't suspect a thing.	rouler dans la farine

			Only later, when he saw the unreasonable charges on his credit card bill, he realized he had been covered with flour .	
Adjectival passive	Matu'aḡ be-arba sikot Stretched with four pins	Dressed up elegantly	Usually his appearance was frumpy and disheveled. However, when he went to the job interview yesterday, he was all stretched with four pins .	Etre tiré à quatre épingles

Beside the list presenting each idiom with its related information, three Forms were used here as well: Form I contained a list of all twelve idioms in semi-random order, (rather than grouped by diathesis of the head), each with its meaning and example. Form II contained tasks for practicing the newly learned idioms: A- a short completion task similar to the one in Experiment 1 but with the new items. B- multi-choice comprehension questions - one for each idiom - about the meaning of the idioms as they appear in certain contexts.

For example, the following is the question for the idiom:

matu'aḡ be-arba sikot

stretched in-four pins

literal meaning: stretched with four pins

idiomatic meaning: elegantly, meticulously dressed

A: what should I wear for the date?

*B: wear something nice, which looks good on you, but on the other hand, don't come all **stretched with four pins**.*

In the dialogue above, when B says "stretched in four pins", she means by it that:

- 1. A should come with her hair tied up with four pins*
- 2. A should come well dressed*
- 3. A should come stressed out.*

This comprehension task was added in order to make the participants better process the idioms and also to serve as an indication for the way the idioms were learnt.

In addition Form II required the indication of age, sex, mother tongue and a second language mastered at a mother-tongue level.

Form III was similar to Form III of Experiment 1 but this time with the new items: The participants were asked to rate the level of likelihood on a 1-5 ordinal scale, where 1 represented "least likely" and 5 – "most likely".

5.2 Results

Exactly the same calculations as in Experiment 1 were used here as well.

The scores for each diathesis were summed up, first within each single participant, then over all 35 participants. Table 5 shows the sum score of each diathesis.

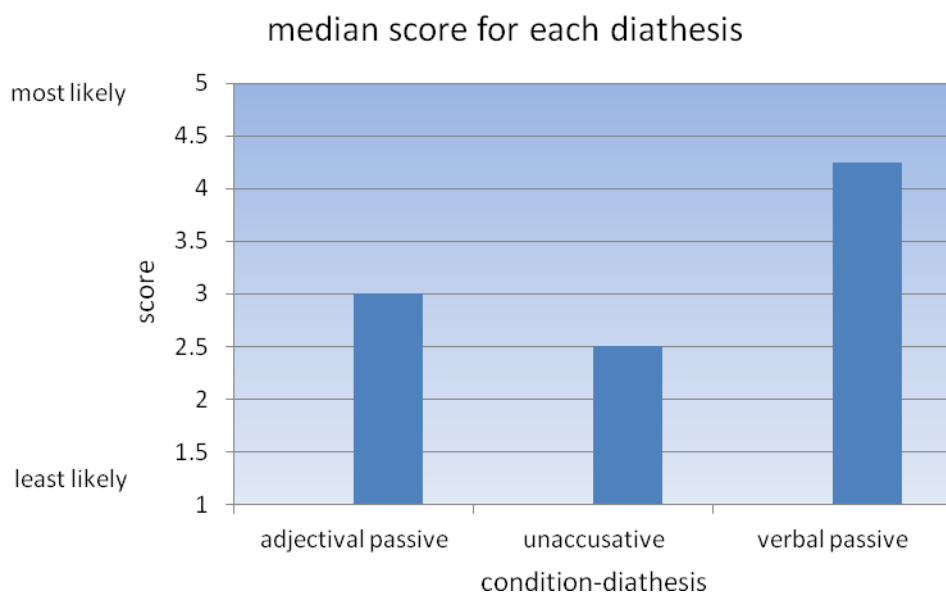
Table 5: Results of Experiment 2 – sum score of each diathesis

Diathesis	Verbal passive	Adjectival passive	Unaccusative
Score	565	381	413

Here, as in Experiment 1, the verbal passive headed idioms surpass both the unaccusative headed idioms and the adjectival passive headed idioms, meaning that this diathesis is conceived as more likely than the other to share idiomatic meanings with the transitive.

At this point, again, we calculated for each participant 3 means with respect to the 3 diatheses, and thus created for each diathesis 35 scores coming from all 35 participants. The following charts (3 and 4) show the differences in median and in mean scores between the three diatheses.

Chart 3 - median scores - each diathesis was rated regarding the question: How likely is it that the diathesis shares the idiomatic meaning with the transitive?



Performing the same significance tests as in Experiment 1, the results are as follows: The difference between verbal passive (med=4.25 interq=0.75) and unaccusatives (med=2.5, interq=1.125) was significant ($z=4.77, p<0.001$ one-tailed). The difference between verbal passive and adjectival passives (med=3 interq=0.75) was also significant ($z=4.71, p<0.001$ one-tailed)⁵. The difference between unaccusative and adjectival passive was not significant ($z=1.7, p=0.09$ two-tailed).

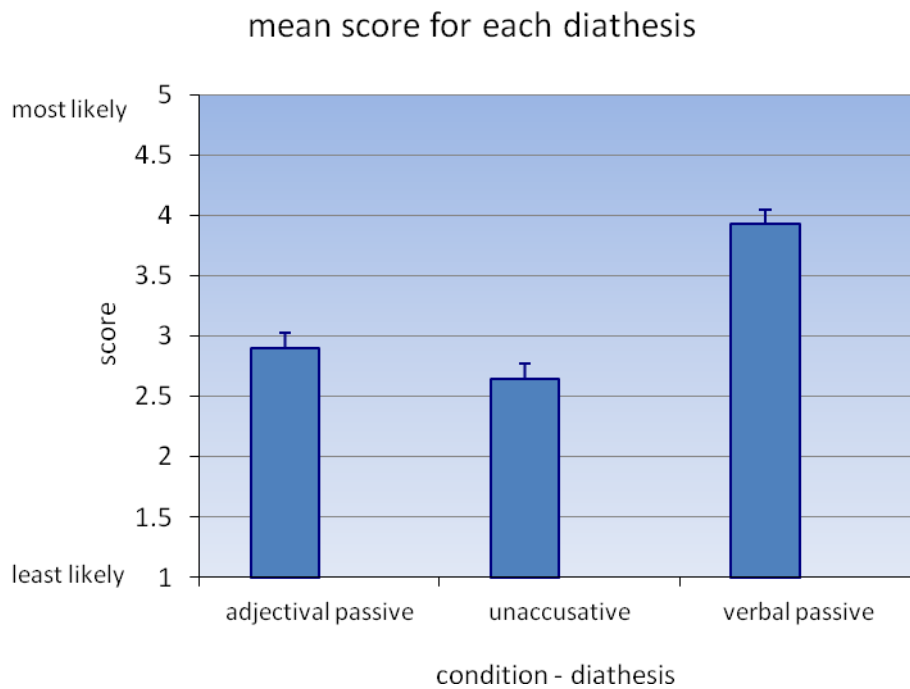
Finally, we compared the means of the three diatheses to 3, the hypothetical mean typical of chance distribution, using a single sample t-test in order to determine the statistical significance of the differences, exactly as we did in Experiment 1.

The verbal passive mean score (3.92) was, this time too, significantly higher than 3: ($t(34)= 5.93 p<0.001$ one-tailed). The adjectival passive mean score (2.9) was not significantly different from 3 ($t(34)= 0.8 p=0.43$ two-tailed), as in Experiment 1. The unaccusative mean score (2.65) was significantly different from 3, ($t(34)= 2.46 p=0.02$ two-tailed) unlike in Experiment 1. It should be noted, however, that the

⁵ The same results were achieved also with paired t-tests: the difference between verbal passives ($m=3.92, sd=0.92$) and unaccusatives ($m=2.65, sd=0.84$) was significant ($t(34)=7.95 p<0.001$ one-tailed) and the difference between verbal passives and adjectival passives ($m=2.9, sd=0.74$) was significant as well ($t(34)= 7.87 p<0.001$ one-tailed). The difference between unaccusatives and adjectival passives was not significant ($t(34)=1.76 p=0.09$ two-tailed).

unaccusative mean was significantly **lower** ($p=0.01$ one-tailed) from the chance distribution mean, that is, opposite in direction to the verbal passive mean which deviated upwards. Thus, this result does not weaken our claim. I resume discussion of this point in section 6. The mean scores of the 3 diatheses are depicted in chart 4 below.

Chart 4- mean scores - each diathesis was rated regarding the question: How likely is it that the diathesis shares the idiomatic meaning with the transitive?



6. Discussion

Both experiments confirm our predictions: there is a significant difference between speakers' conception of idioms headed by a verbal passive and their conception of idioms headed by either an unaccusative or an adjectival passive: the likelihood by which verbal passive shares idiomatic meaning with its transitive counterpart is conceived as significantly higher than the likelihood by which adjectival passive or unaccusative share idiomatic meaning with their transitive counterpart. This kind of difference was not found between idioms headed by an unaccusative and idioms headed by an adjectival passive.

These results reinforce the head-based storage hypothesis (6a), according to which phrasal idioms are stored under their lexical head, the actual predicate heading the idiom, specified for diathesis, as argued by Horvath & Siloni (2009a).

The root-storage option is ruled out, because if the idioms were stored under an abstract root structure, we would have gotten the same idiom distribution for all three diatheses. The idea that phrasal idioms are listed as "big words" or "big lexemes", is also ruled out, because if idioms were stored each as a single lexical unit, we would get the same unique-idiom behavior demonstrated in each one of the three diatheses, as each version of an idiom could be listed, by this logic, in the lexicon.

As for the question whether idioms are stored as linguistic information or not, the results reinforce the linguistic approach: if idioms were not stored as part of the linguistic knowledge, their storage would not be sensitive to a linguistic feature such as the diathesis of the head. The high tendency of the verbal passive to share the idiomatic meaning with its transitive counterpart, or alternatively, the low tendency of the verbal passive to participate in unique idioms, supports the assumption that verbal passives, unlike adjectival passives and unaccusatives, are not entries in the lexicon and are produced post-lexically as has already been claimed (for example, Horvath & Siloni, 2008; Collins, 2005; Baker, Johnson and Roberts, 1989). This also demonstrates the inaccessibility of post-lexical items to the lexicon, as predicted by the modularity approach to mental grammar.

The fact that idioms headed by an unaccusative and idioms headed by an adjectival passive were conceived as significantly more likely to be unique idioms, reinforces the claim that these diatheses are listed as entries in the lexicon, as has been already suggested on independent grounds (unaccusatives: Chierchia, 2004; Horvath & Siloni,

to appear; Levin & Rappaport, 1995; Reinhart 2002 and adjectival passives: Horvath & Siloni, 2008; Levin & Rappaport, 1986; Meltzer, to appear). Between these two diatheses no significant difference was found, which is expected: If unaccusatives and adjectival passives are both listed in the lexicon, there should not be a difference between them in the tendency to share idiomatic meaning with the transitive.

The above conclusions receive further support from the comparison between the mean score of each diathesis and the hypothetical mean (mean=3) under the assumption of "chance distribution" i.e. the case where participants make their choices randomly, with no specific criteria guiding them. The fact that, in Experiment 1 the unaccusative and adjectival passive means are characteristic of chance distribution, is expected because predicates of these diatheses may equally share or not share their idiomatic meaning with their transitive counterparts as both are lexical entries (Horvath & Siloni's 2009a), and hence participants responded arbitrarily for each of these diatheses. The fact that the verbal passive mean is significantly different, and actually significantly higher than the expected mean in chance distribution, shows that in this case there was some systematic factor that led the responses in one direction. More specifically, the verbal passive idioms showed a real, not accidental tendency to share meaning with the transitive. Repeating this comparison in Experiment 2, the verbal passive mean was again significantly higher than 3, and the adjectival passive was, again, not significantly different from 3. The unaccusative mean, however, was found to be significantly different from 3, contra (our) expectations. Importantly, though, this mean score was significantly lower (not higher) than 3. Therefore it does not undermine the conclusion regarding the difference between verbal passives on the one hand and adjectival passives and unaccusatives on the other. That is, the unaccusative, in this experiment, tends not to share idiomatic meaning with its transitive alternate, unlike verbal passive. Why didn't we get a mean score indicative of chance distribution as was expected? It seems that in Experiment 2 some factor made it less plausible for some (or all of the) unaccusative idioms to have a transitive version. A further examination of the unaccusative headed idioms that were used in the experiment reveals that one of them – *hitkarer-ba-eynaim* (8) indeed received a mean score significantly lower than 3 (mean=1.69) ($t(34)= 6.57$ $p<0.001$ one-tailed).

(8) *hitkarer-ba-eynaim*
got cold in+the-eyes

meaning: got scared

Not taking this item into account, the unaccusative mean turns out to be, as predicted, *not* significantly different from 3 (mean=2.97) ($t(34)= 0.18$ $p=0.86$ two-tailed). What could have caused the deviation of this idiom from chance distribution? The idiom *hitkarer ba-einaim* is very much reminiscent of the Hebrew idiom *kibel raglayim karot* (9).

(9) *kibel raglayim karot*

Got feet cold

Got cold feet

The latter idiom has the same meaning ('got scared') as the experiment item. It is headed by the verb *kibel*, which itself seems transitive (it is a two-place verb that takes an accusative object), and as such does not and cannot have a transitive counterpart. It could be that the association of *hitkarer ba-eynaim* with the idiom headed by *kibel*, had an influence producing lower scores for the item *hitkarer-ba-eynaim*, which lowered the unaccusative average altogether. In conclusion, it seems that there was a specific reason this idiom did not show chance distribution and this affected the results. Importantly, however, it does not challenge or interfere with our assertions and argumentation about idiom storage and the mental lexicon: the fact that verbal passives' tendency to share idioms with the transitive is significantly higher than this tendency in both unaccusative and adjectival passives, remains, and in any case suggests (together with the fact that verbal passive is post-lexical) that idioms must be stored as sub-entries of their lexical head, that the lexicon contains predicates rather than just abstract roots, and that the lexicon involves derivation processes.

Since unaccusative and adjectival passive are entries in the lexicon, it follows that the processes deriving them need not be repeated in each use of the word, as there is evidence that they are listed in the lexicon. The systematic relations between them and the inputs of the processes deriving them can be captured by a lexical rule. The rule is operative very early in language development and is clearly accessible later on as is evident in adult use of language, that is, their ability to activate it with new words and with non-words. The reason we did not get absolute results but rather statistical

tendencies is that a) the responses required were on a 1-5 scale rather than yes/no decisions and b) linguistic judgments, by their nature as a psychological measure, are relatively highly sensitive to variation, therefore expecting an absolute all-or-none result would have been unrealistic.

Besides the case of the unaccusative item mentioned above which possibly had an irrelevant influence on the results, there is another possible bias that should be taken into account. First, as the idioms have a tense, each of them could be conceived by the participants as a clausal rather than a phrasal idiom. Clausal idioms, as mentioned in section 2, are not at all flexible, and so would not be conceived as sharing idiomatic meaning with the transitive. This could have affected the verbal passive score, making it lower than it should have been without this bias.

7. Conclusions

Returning to the two fundamental questions regarding the mental lexicon, which were introduced in section 1, the findings of this study suggest two respective answers: First, the affirmation of the head-based storage hypothesis (6a) directly bears on the word vs. root question concerning the structure of the mental lexicon. If idioms are stored as sub-entries of the predicate that heads them, then the entries in the lexicon are words, like these specific predicates, rather than roots. Secondly, if derived predicates like unaccusatives and adjectival passives are listed in the lexicon, it follows that their derivation processes have taken place in the lexicon. This means that the mental lexicon is an active component rather than a list (or lists) of basic entries.

The next step to follow from this study is to generalize it to other languages. Each language that shows the same picture of idiom storage would further validate our conclusions about the structure of the mental lexicon. Applying the discussed experiments to English, for example, is of particular interest since this language is known to have a much more frequent use of passive forms in spoken language than Hebrew. This may be said to pose a challenge for our predictions because allegedly there is more chance to find verbal passive headed idioms that are (conceived) unique. If the verbal passive idioms still get a significantly higher score than the other 2 diatheses i.e. still demonstrate a relatively higher tendency to share idiomatic meanings with the transitive, this will provide an important validation of our conclusions.

Another direction for further research is to investigate the storage of noun phrasal idioms and idioms headed by other lexical categories.

Clausal idioms, as mentioned above in section 2.1 have been suggested by Horvath and Siloni (2009b) to be stored as "separated complex lexemes", and research in this question is currently taking place.

Finally, a better understanding of the storage technique used by the mental lexicon may have important educational implications for both typical and language-impaired population (Horvath and Siloni 2009b)

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Appendix 1 – materials of Experiment 1

יצא עם נחתה ורדים

התפרק לארבע

יצוק מחול

גלקח טרמפ

עשוי מחומר קשית יותר

עטוף עד התשיעיות

זופת באותה המברשת

עבר תחת קלשונות חדים

לוטף בכיוון הלא נכון

- **יצא עם ניחוח ורדים** – הצליח להסתיר את היותו מעורב בדבר מפוקפק
ההאשמות נגדך קשות ויש לך שם של עבריינין. אבל אל תדאג, אנחנו נשיג לך עורך דין טוב ואתה תצא עם ניחוח ורדים.
- **התפרק לארבע** – עשה מאמצים גדולים
'בסוף אתה לא צריך את הספר הזה?? התפרקתי לארבע כדי להשיג אותו!'
- **יצוק מחול** – לא יציב
מערכת היחסים שלהם יצוקה מחול. הם עתידים להיפרד במוקדם או במאוחר.
- **נלקח טרמפ - רומה**,
הוא כל כך תמים, תמיד הוא נלקח טרמפ.
- **עשוי מחומר קשיח יותר** – קשוח יותר
התקופה הזאת הייתה טראומטית לשני האחים. הגדול נעשה מסוגר מאז, הפסיק את הקריירה, והכל, אבל הצעיר חזר לעצמו, הוא עשוי מחומר קשיח יותר
- **עטוף עד התשיעיות** – לבוש באופן אלגנטי
אמא של יוסי תמיד נראית אלגנטית ומטופחת ללא רבב. אפילו לאסיפות דיירים היא מגיעה עטופה עד התשיעיות.
- **זופת באותה המברשת** - ניחן באותן תכונות
אם אתה לא אהבת את ההצגה בטח גם הוא לא יאהב אותה. אתם הרי זופתם באותה המברשת.
- **עבר תחת קלשונות חדים** – הוכנע בתנאים משפילים.
לבסוף לא רק שהתובע זכה, בית המשפט קבע שעל הנתבע להתנצל בפומבי, לפצות את התובע בסכום גדול ובנוסף לסגור את בית העסק למשך שבוע. בקיצור הצד הנתבע עבר תחת קלשונות חדים.
- **לוטף בכיוון הלא נכון** - בטעות נעשה לו משהו שגורם לו להתעצבן.

הוא בדרך כלל אדם נחמד, לא יודעת מה קרה לו הבוקר. כנראה בדרך לעבודה הוא לוטף בכיוון הלא נכון.

תרגילי השלמה:

עשה מאמצים גדולים: התפרק _____

יותר קשוח: עשוי מחומר _____

חולק את אותן תכונות: זופת ב _____ המברשת

הצליח לחמוק מאשמה: יצא עם _____

לא יציב: יצוק _____

לבוש אלגנטי: עטוף עד _____

נעשה לו דבר מה שמעצבן אותו: לוטף בכיוון ה _____

רומה: נלקח _____

הוכנע בתנאים משפילים: עבר תחת _____

למדת את הניב: **יצוק מחול**.

עד כמה נראה לך סביר שקיים גם הניב:

יצקו אותו מחול.

(מ-1 עד 5, 1=הכי פחות סביר ו-5= בטוח שקיים ניב כזה)

למדת את הניב: **התפרק לארבע**. עד כמה נראה לך סביר שקיים גם הניב:

פירק אותו לארבע.

למדת את הניב: **זופת באותה המברשת**. עד כמה נראה לך סביר שקיים גם הניב:

זיפתו אותו באותה המברשת.

למדת את הניב: **עבר תחת קלשונות חדים**. עד כמה נראה לך סביר שקיים גם הניב:

העביר אותו תחת קלשונות חדים.

למדת את הניב: **עשוי מחומר קשיח יותר**. עד כמה נראה לך סביר שקיים גם הניב:

עשו אותו מחומר קשיח יותר

למדת את הניב: **יצא עם ניחוח ורדים**. עד כמה נראה לך סביר שקיים גם הניב:

הוציא אותו עם ניחוח ורדים

למדת את הניב: **עטוף עד התשיעיות**. עד כמה נראה לך סביר שקיים גם הניב:

עטפו אותו עד התשיעיות.

למדת את הניב: **נלקח טרמפ**. עד כמה נראה לך סביר שקיים גם הניב:

לקחו אותו טרמפ.

למדת את הניב: **לוטף בכיוון הלא נכון**. עד כמה נראה לך סביר שקיים גם הניב:

ליטפו אותו בכיוון הלא נכון.

Appendix 2 – materials of Experiment 2

תפור בחוט לבן

עבר תחת קלשונות חדים.

כוסה בקמח.

עלה על סוסי המלחמה שלו

מתוח בארבע סיכות

נדלה ממים עכורים

הונח על הגריל

צרוב בברזל אדום

התקרר בעיניים

יצא עם סנפיר בידו

נשלח לטיול

ארוז במצעים נאים

ניבים ופירושיהם + דוגמאות להקשר המתאים

- **תפור בחוט לבן** – ברור מאוד, בולט.
מדבריו כולם הבינו במי הוא עומד לתמוך. זה היה תפור בחוט לבן.
- **עבר תחת קלשונות חדים**. – הוכנע בתנאים משפיליים.
לבסוף, לא רק שהתובע זכה, ביהמ"ש קבע שעל הנתבע להתנצל בפומבי, לפצות את התובע בסכום עתק ובנוסף לסגור את בית העסק למשך שבוע. בקיצור, הצד הנתבע עבר תחת קלשונות חדים.
- **כוסה בקמח** – רומה.
כאשר בא סוכן והציע לו את העסקה הזאת, דני לא חשד בדבר. רק אחר כך כשראה את החיובים הבלתי הגיוניים בכרטיס האשראי שלו, הבין שהוא כוסה בקמח.
- **עלה על סוסי המלחמה שלו** – התכוונן לקרב רציני
עד עכשיו התנהגתי איתכם בעדינות. אבל אם התופעה תחזור על עצמה עוד פעם אחת, אני עולה על סוסי המלחמה שלי.
- **מתוח בארבע סיכות** – לבוש בהקפדה
בדרך כלל הוא מרושל ולובש "סחבות", אבל לראיון העבודה אתמול הוא הלך מתוח בארבע סיכות.
- **נדלה ממים עכורים** – הושג תוך ניצול מצב עניינים בעייתי.
כל ההצלחות הפוליטיות שלו נדלו ממים עכורים. החל ממינויו לשר, שהתאפשר רק בחסות מצב המלחמה.
- **הונח על הגריל** – הוכנס למצב של אי שקט
כשהוא התקשר שוב לשאול מה החליטה בעניינו הועדה הרפואית, נאמר לו שהועדה נדחתה מסיבות טכניות וכך הוא הונח על הגריל לעוד חודשיים.
- **צרוב בברזל אדום** – מסומן כפסול או בעייתי. שגורלו נחרץ.
מאז אותה פרשה הוא צרוב בברזל אדום והסיכוי שיימצא לו שידוך הוא כמעט אפסי.
- **התקרר בעיניים** – נתקף פחד.

הוא הגיע עד פתח ביתה של אהבת נעוריו, אך ברגע האחרון התקרר בעיניים וחזר על עקבותיו.

- **יצא עם סנפיר בידו** - נותר מאוכזב, מבלי שציפיותיו התגשמו.

המועמד השקיע בקמפיין ענק שכלל ערב התרמה גרנדיוזי אבל בסופו של דבר, בגלל ניהול רשלני של הקמפיין, הוא יצא עם סנפיר בידו – בבחירות הוא לא עבר את אחוז החסימה.

- **נשלח לטיול** – נדחה. נתקל בדחיה.

הוא הגיש מספר בקשות למשרד הבריאות על מנת שיוסיפו תקנים לעובדים נוספים אבל כל פעם מחדש הוא נשלח לטיול.

- **ארוז במצעים נאים** – נתון תחת ביקורת חברתית/ציבורית.

כשמנהיג ציבורי מנהל רומן מהצד הוא צריך לקחת בחשבון שהוא עלול למצוא את עצמו ארוז במצעים נאים

טופס מספר _____

גיל _____

נקבה / זכר

שפת אם _____

שפה נוספת ברמת שפת אם _____

השלימו את הניבים:

1. תפור ב _____

2. עבר תחת _____

3. כוסה ב _____

4. עלה על _____ שלו

5. מתוח בארבע _____

6. נדלה ממים _____

7. הונח על _____

8. צרוב ב _____

9. התקרר ב _____

10. יצא עם _____ בידו

11. נשלח ל _____

12. ארוז במצעים _____

אנא קראו בכל שאלה את הדיאלוג וענו על השאלה הרב-ברירתית
1.

- א: השופטים לא אהבו את הביצוע שלו.
ב: איך אתה יודע?
א: מה קרה לך, זה היה תפור בחוט לבן בתגובות שלהם.

במקרה זה, הכוונה בביטוי 'תפור בחוט לבן' היא ש:

1. התגובות של השופטים היו תפורות על בד בחוט לבן.
2. עמדת השופטים היתה ברורה מתגובותיהם.
3. העמדה המסתייגת של השופטים היתה חלק בלתי נפרד מהתגובות שלהם.

2.

- א: במלחמת העולם הראשונה גרמניה הפסידה
ב: לא סתם הפסידה: היא נאלצה לעבור תחת קלשונות חדים.

במקרה זה, הכוונה בביטוי 'לעבור תחת קלשונות חדים' היא ש:

1. גרמניה נאלצה להיכנע בתנאים משפילים
2. גרמניה נאלצה להשקיע בחקלאות שלה
3. הצבא הגרמני נלכד באמצעות קלשונות עד שנאלץ להיכנע.

3.

- א: האופניים האלה הם של ג'יסי, חדשות.
ב: כמה הוא שילם עליהן?
א: אלפיים דולר. אמרו לו שהן אופניים הולנדיות באיכות נדירה.
ב: חביבי, תגיד לג'יסי שלך שהוא כוסה בקמח. זה אופניים משומשות מהתחנה המרכזית ששוות מקסימום מאה חמישים שקל.

במקרה זה, הכוונה בביטוי 'כוסה בקמח' היא ש:

1. הג'יסי שקע בחובות
2. הג'יסי היה אופה ובזמן הקניה הרכיב משקפיים מלוכלכות בקמח, לכן היה לו קשה לאמוד את שווי האופניים.
3. הג'יסי היה קורבן לתרמית.

4.

- א: השכן כועס על הרעש שעשינו אתמול בלילה?
ב: כן, מאוד. לפי איך שדיבר, נראה שהפעם הוא עולה על סוסי המלחמה שלו.

במקרה זה, בהכוונה ביטוי 'עולה על סוסי המלחמה שלו' היא ש:

1. בגלל הרעש, השכן מתכוון לפרוץ לחצר של הדוברים כשהוא רכוב על סוסים
2. השכן מתכוון לנקוט בצעדים נגד הדוברים לאחר שהרעישו.
3. השכן החליט להסתגר בביתו ולהתמסר למשחק שחמט.

5.

- א: מה כדאי ללבוש לפגישה?
ב: תלבשי בגדים יפים, שאת נראית בהם טוב,
אבל מצד שני אל תבואי כולך מתוחה בארבע סיכות.

במקרה זה, הכוונה בביטוי 'מתוחה בארבע סיכות' היא ש:

1. היא תבוא עם שיער אסוף חזק בארבע סיכות ראש
2. היא תבוא בלבוש מוקפד
3. היא תבוא מתוחה.

6.

- א: אתה לא שמח על המשרה החדשה?
ב: השמחה לא שלמה: המשרה התפנתה כי העיפו את יהודה – שהיה עובד מצויין אבל הבוס רצה לטרפד את התקדמותו. כך שהמשרה הזאת בעצם **נדלתה ממים עכורים**

- במקרה זה, הכוונה בביטוי 'נדלתה ממים עכורים' היא ש:
1. המשרה החדשה קשורה לעבודה בניקוז מי-ביוב.
2. היה קשה להשיג את המשרה
3. המשרה הושגה תוך ניצול של מצב לא צודק.

7.

- א: שמעת שאישרו לאמנון ותמר את אימוץ הילדה?
ב: סופסוף, מגיע להם, אחרי שהזוג הזה הונח על הגריל למשך שנה וחצי כמעט.

- במקרה זה, הכוונה בביטוי 'הונח על הגריל' היא ש:
1. בני הזוג נאלצו לעבוד למשך שנה וחצי במסעדת בשר "על האש"
2. נבני הזוג אלצו להמתין כשהם חסרי סבלנות ולא רגועים.
3. בני הזוג נאלצו לסבול עינויים קשים במשך שנה וחצי.

8.

- א: בכלא, היחס של האסירים למי שיושב על עבירות מין הוא הקשה ביותר.
ב: ומה אם הוא מתגלה כחבר טוב, או עובר תהליך של חזרה למוטב...
א: זה לא יעזור לו. מבחינתם הוא **צרוּב בברזל אדום**.

- במקרה זה, הכוונה בביטוי 'צרוּב בברזל אדום' היא ש:
1. אסיר שיושב על עבירת מין מסומן כפסול. כראוי ליחס שונה.
2. בכלא מי שנכנס על עבירות מין עובר צריבה של קעקוע אדום על הזרוע.
3. מי שנכנס על עבירות מין הוא להוט כולו.

9.

- א: בטיול למזרח, קפצת "בנג'י"?
ב: התכוונתי לקפוץ. אבל לא קפצתי בסוף.
א: מה קרה?
ב: לפני הקפיצה הסתכלתי למטה לתהום ומיד **התקררתי בעיניים**.

- במקרה זה, הכוונה בביטוי 'התקררתי בעיניים' היא ש:
1. ב' התחרט כי חש שההתלהבות שלו פגה.
2. ב' חש בתסמין המפורסם התוקף תרמילאים בהימלאיה – תחושת קור צורב בעיניים.
3. ב' נתקף פחד.

10.

- א: כבר קנית בגדים לחתונה של אחותך?
ב: עוד לא מצאתי שום דבר מתאים. השבוע דווקא הסתובבתי בכל החנויות במרכז העיר, אבל **יצאתי עם סנפיר בידי**.

- במקרה זה, הכוונה בביטוי 'יצאתי עם סנפיר בידי' היא ש:
1. מרוב מדידות בגדים, כל מה שרציתי בסוף היה ללכת לים ולשחות כמו דג.
2. לא מצאתי שום בגד אבל קניתי לי דג זהב.
3. נותרתי מאוכזבת כי לא השגתי את מה שקיוויתי למצוא.

.11

- א: האם יש דפוס חוזר בחיי הזוגיות של הבן שלך?
ב: כן. בכל פעם הוא מתחיל עם מישהי לא-פנויה, **נשלח לטיול** ואז שוקע במלנכוליה למשך זמן מה.

- במקרה זה, הכוונה בביטוי 'נשלח לטיול' היא ש:
1. הבחורה שהוא מתחיל איתה מבקשת ממנו לבצע בשבילה מטלות שונות.
2. הוא נדחה על ידי הבחורה שהוא מתחיל איתה.
3. הוא מתחיל עם בחורה ובתגובה היא מציעה לו לצאת לטיול בארץ כשההוצאות על חשבונה.

.12

- א: מה אתה חושב על המאמר שאני הולך לשלוח לעיתון?
ב: נועז מאוד. אתה לא חושש לפרסם דבר כזה?
א: לא. לפעמים צריך להגיד לציבור את האמת שלך.
ב: זו זכותך. אבל אל תתפלא אם למחרת הפרסום תהיה **ארוז במצעים נאים**.

- במקרה זה, הכוונה בביטוי 'ארוז במצעים נאים' היא ש:
1. בעקבות הפרסום א' יזכה לפרסום ותהילה.
2. בעקבות הפרסום א' יסתגר בבית ויהיה ספון במיטתו מתחת לשמיכות.
3. בעקבות הפרסום א' יהיה נתון לביקורת ציבורית.

טופס מספר _____

למדת את הניב: **תפור בחוט לבן**. עד כמה נראה לך שקיים גם הניב:

'תפרו אותו בחוט לבן' ?

אנא ענה על שאלה זו ועל השאלות הבאות באמצעות דירוג מ-1 – **הכי פחות סביר** עד 5 – **בטוח שהניב קיים** (סמן בעיגול את מה שבחרת).

1 2 3 4 5

למדת את הניב: **עבר תחת קלשונות חדים**. עד כמה נראה לך סביר שקיים גם הניב:

'העבירו אותו תחת קלשונות חדים' ?

1 2 3 4 5

למדת את הניב: **כוסה בקמח**. עד כמה נראה לך סביר שקיים גם הניב:

'כיסו אותו בקמח' ?

1 2 3 4 5

למדת את הניב: **עלה על סוסי המלחמה שלו**. עד כמה נראה לך סביר שקיים גם הניב:

'העלו אותו על סוסי המלחמה שלו' ?

1 2 3 4 5

למדת את הניב: **מתוח בארבע סיכות**. עד כמה נראה לך סביר שקיים גם הניב:

'מתחו אותו בארבע סיכות' ?

1 2 3 4 5

למדת את הניב: **נדלה ממים עכורים**. עד כמה נראה לך סביר שקיים גם הניב:

'דלו אותו ממים עכורים' ?

1 2 3 4 5

למדת את הניב: **הונח על הגריל**. עד כמה נראה לך סביר שקיים גם הניב:

'הניחו אותו על הגריל' ?

5 4 3 2 1

למדת את הניב: **צרוּב בברזל אדום**. עד כמה נראה לך סביר שקיים גם הניב:

'צרכו אותו בברזל אדום'?

5 4 3 2 1

למדת את הניב: **התקרה בעיניים**. עד כמה נראה לך סביר שקיים גם הניב:

'קיררו אותו בעיניים'?

5 4 3 2 1

למדת את הניב: **יצא עם סנפיר בידו**. עד כמה נראה לך סביר שקיים גם הניב:

'הוציאו אותו עם סנפיר בידו'?

5 4 3 2 1

למדת את הניב: **נשלח לטיול**. עד כמה נראה לך סביר שקיים גם הניב:

'שלחו אותו לטיול'?

5 4 3 2 1

למדת את הניב: **ארוז במצעים נאים**. עד כמה נראה לך סביר שקיים גם הניב:

'ארוזו אותו במצעים נאים'?

5 4 3 2 1

אוניברסיטת תל-אביב
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החוג לבלשנות

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חיבור זה הוגש כעבודת גמר לקראת התואר "מוסמך אוניברסיטה" – M.A באוניברסיטת ת"א

על ידי:
הדר קלונובר

העבודה הוכנה בהדרכת:
פרופסור טל סילוני
פרופסור ג'וליה הורבט

פברואר 2012