Intensified Response Particles to Assertions and Polar Questions: The Case of Hebrew *legamrey**

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0.   Introduction

Response particles, such as *yes* and *no*, seen in (1), and their cross-linguistic correlates got much attention in the literature (cf. Farkas and Bruce (2009), Krifka (2013), Farkas and Roelofsen (2015, 2017), Goodhue and Wagner (2018)):

(1)   A: John is home / Is John home?
        B: Yes
        B': No

In this paper we want to draw attention to what we will call "intensified response particles", some examples of which are seen in (2). Such responses are very common in dialogues, but there is hardly any attempt in the literature to provide them with a compositional interpretation and to integrate their analysis within general theories of response particles:[1]

(2)   A: John is home / Is John home?
        B: Sure! / Absolutely! / Of course ! No question about it!
        B': No way! / Hell no!

The goal of this paper is to contribute to an understanding of this common phenomena by examining one 'intensified response' particle in Hebrew, namely *legamrey*$_{resp}$, (paraphrased as English *absolutely* and German *absolut*). To do that we will deal with two challenges that this particle raises. The first is to give a unified compositional analysis to both this response particle as well as to a more standard use of *legamrey*, functioning as an inten-

[1]An exception is Kramer and Rawlins (2012)

sifying degree modifier of gradable expressions (e.g. adjectives) within the propositional level (similarly to English *completely*). We call this use *legamrey$_{prop}$*. The second challenge is to understand the varied behavior of *legamrey$_{resp}$*,compared to two other response particles in Hebrew, namely *ken* ($\approx$ *yes / ja)* and *naxon* ($\approx$ *right*).

We propose that both challenges are met by analyzing *legamrey$_{resp}$* as a degree modifier of the gradable speech act operator *ASSERT* (following a suggestion in (Greenberg and Wolf 2017)), maximizing the degree of credence the speaker has towards the asserted proposition, which is itself anaphoric to a previously asserted / questioned proposition.

The paper is structured as follows: In section 1 we introduce the first challenge, i.e. the fact that one and the same particle seems to have two distinct, but intuitively related uses, namely *legamrey$_{prop}$*, modifying gradable expressions within the propositional level, and *legamrey$_{resp}$*, the intensifying response particle. Section 2 lays out some background assumptions suggested in Greenberg and Wolf (2017), namely that assertion speech acts are gradable predicates (involving a degrees of credence). Based on these assumptions we propose in section 3 that *legamrey$_{resp}$* is also a degree modifier of gradable assertions, involving anaphora, and show how this suggestion derives both the similarities and the differences between it and *legamrey$_{prop}$*. Section 4 turns to the second challenge, namely explaining the behavior of *legamrey$_{resp}$* relative to the Hebrew response particles *ken* and *naxon*. In section 5 we analyze the latter particles following Krifka's (2013) suggestions about the German response particle *ja* (analyzed as anaphoric to a proposition) and the English *right* (analyzed as anaphoric to speech acts). We then show in section 6 how the similarities and differences between these particles and *legamrey$_{resp}$* follow from our suggestion that the latter is an anaphoric degree modifier of *ASSERT*. Section 7 concludes and points out some directions for future research.

1. The first challenge: Unifying two uses of Hebrew *legamrey*

In modern Hebrew the particle *legamrey* has two uses. On its standard use, which we will call *legamrey$_{prop}$* it is an intensifying degree modifier within the propositional level. Similarly to what is described in e.g. Kennedy and McNally (2005) for English *completely*, *legamrey$_{prop}$* can felicitously modify only upper-closed predicates. It is infelicitous with relative adjectives (e.g. *expensive*) or with non-gradable predicates (e.g. *fell down*) (3):

(3)   ha-agartal legamrey male / #yakar / #nafal
        The-vase le-gamrey full / expensive / fell down
        'The vase (is) completely full / #expensive / #fell down'

Kennedy and McNally (2005) take *completely* to combine with a gradable expression *G* (type $<d,<e,t>>$) and an individual *x* and yields truth iff the degree that *x* has on the scale associated with *G* is at the maximal endpoint of the scale. *Completely* is infelicitous with e.g. relative adjectives (which are associated with scales with no maximal endpoints) and with non-gradable expressions (which are not associated with any scale what so ever). We will make the same assumptions regarding *legamrey$_{prop}$* in Hebrew:

(4)   *[legamrey$_{prop}$]] = [completely]] $\lambda G.\lambda x.\exists d\ [d=max(SG) \wedge G(d)(x)]$*

However, unlike English *completely*, *legamrey* can also be used in another way, namely as a response particle. We will call this use *legamrey$_{resp}$*. Crucially, in this use *legamrey* is felicitous even when responding to assertions and questions with relative / non-gradable predicates (5):

(5)   A: ha-agartal male / yakar / nafal?
       The-vase full / expensive / fell down
       'The vase (is) full / expensive / fell down'
       Or
       'Is / did the vase full / expensive / fall down?'
       B: *legamrey$_{resp}$*
       Legamrey
       'Absolutely / Definitely'

As seen in the gloss, *legamrey$_{resp}$* can be translated as *absolutely* or *definitely*, indicating that its user is completely certain of the proposition asserted / questioned by A.

   Both uses of *legamrey*, then, have a similar intensifying effect. We would like to suggest that this is not accidental, i.e. that the two particles can be given a similar analysis. But how can this be done? With *legamrey$_{prop}$* we already have an existing compositional analysis of this particle as a degree modifier, clarifying how the intensification effect is created. The challenge is to capture the similar intensification effect of *legamrey$_{resp}$* in a compositional way too. In particular, can we also model *legamrey$_{resp}$* as a degree modifier? But, if so, what gradable predicate does it modify?

   One could try to argue that there is a covert gradable *agree* predicate in B's response, so *legamrey* is understood as *I completely agree (with A)*. Notice, though, that while this may be taken as a reasonable reaction to an assertion by A, reacting this like to a polar question is odd. In contrast, *legamrey$_{resp}$* is equally felicitous in reacting to assertions and polar questions. Thus, taking seriously the idea that this particle is similar to *legamrey$_{prop}$* in being a degree modifier, we need to think about another gradable predicate it modifies. In the next sections we suggest, following Greenberg and Wolf (2017), that assertion speech acts can constitute the right gradable predicate.

2.   Assertion speech acts as gradable (Greenberg & Wolf 2017)

Greenberg and Wolf (2017)(G&W, henceforth) propose a compositional analysis of the assertion speech act operator *ASSERT* as a gradable expression. Their proposal is inspired by several existing ideas and suggestions, namely (a) the idea that speech acts are compositionally active (e.g. Krifka (2014), Thomas (2014), Beck (2016)), and more specifically, that assertion speech acts are introduced by an *ASSERT* operator, heading an ActP, which indicates the belief / credence of the assertion performer in the asserted proposition (cf. Mayer (2013),Krifka (2014),Wolf (2015a)), (b) suggestions (in e.g. Yalcin (2010), Lassister (2016)) to treat epistemic modal expressions as indicating degrees of belief / credence of

propositions, and (*c*) suggestions to treat epistemic modal adverbs (MADVs henceforth) as speech act modifiers, which indicate the degree to which the assertion performer believes in the asserted proposition (cf. Nuyts (2001), Piñón (2009), Wolf (2015a,b)). Integrating these ideas, G&W propose that *ASSERT* involve graded modality as well. More formally, G&W propose the following general recipe:

(6)   A general recipe for interpreting assertion speech acts as gradable (G&W 2017):
        <u>Move 1:</u> Supplement existing entries of *ASSERT* with a credence degree argument
        <u>Move 2:</u> Analyze Modal Adverbs (MADVs) as overt degree modifiers of *ASSERT*,
        <u>Move 3:</u> Take apparently unmodified assertions, to be modified by a covert *POS*

To illustrate, let us take as a basic entry for the speech act operator *ASSERT* a dynamic entry proposed in (Krifka 2014) (with some simplifications)(7). In prose: *ASSERT* combines with a proposition *p* and a context *c* and yields the context *c'* where the CG is updated with *ASSERT (p)(c)*, which holds in *w* iff the speaker believes in *w* that *p* at time c_t:

(7) $[ASSERT]]^{g,w}_{<<s,t>,<c,c>>}$ $\lambda p.\lambda c.\ \iota c':\ c'=\ <c_{sp(eaker)},\ c_{h(earer)},\ c_t,\ C_w \cap \{w:$
        $ASSERT(p)(c))\} >$

The first move proposed in G&W is to supplement the entry with a degree argument. Relying on (7), then, this move results in (8). In prose: *ASSERT* combines with a proposition *p*, a credence degree *d*, and a context *c* and yields the context *c'* where the CG is updated with the information that the speaker's degree of credence of *p* in *w* at time c_t is *d*:

(8) $[ASSERT]]^{g,w}_{<s,t>,<\underline{d},<c,c>>>}$ $\lambda p.\lambda\underline{d}.\lambda c.\ \iota c':\ c'=\ <c_{sp(eaker)},\ c_{h(earer)},\ c_t,\ C_w \cap$
        $\{w: ASSERT(p)(\underline{d})(c))\} >$

The second move takes MADVs to function as overt degree modifiers over assertions. This is seen in (9), where such adverbs combine with a gradable speech act operator, *G* (typically *ASSERT*)[2], a proposition, *p*, a degree *d* (typically a credence degree) and a context *c*:

(9)   a. $[[Possibly]]^{g,w}$: $\lambda\ G.\ \lambda p.\lambda d.\ \lambda c.\ \iota c':\ c'=<c_{sp},\ c_h,\ c_t,\ c_w \cap\{w: \exists\ d\ \mathbf{d}> \mathbf{0} \wedge$
        $G(p)(d)(c)\} >$
        b. $[[Probably]]^{g,w}$: $\lambda\ G.\ \lambda p.\lambda d.\ \lambda c.\ \iota c':\ c'=<c_{sp},\ c_h,\ c_t,\ c_w \cap\{w: \exists\ d\ d> 0.5 \wedge$
        $G(p)(d)(c)\} >$
        c. $[[absolutely]]^{g,w}$: $\lambda\ G.\ \lambda p.\lambda d.\ \lambda c.\ \iota c':\ c'=<c_{sp},c_h,c_t,c_w\cap\{w: \exists\ d\ \mathbf{d}= d=max(S_G)$
        $\wedge\ G(p)(d)(c)\} >$

Thus, for example, asserting *John is probably a thief* and *John is absolutely a thief* are modeled as in (10a-11a), resulting in (10b-11b), namely with the unique context where the speaker believes in *w* that John is a thief to a credence degree which is higher than 0.5" (with *probably*) and which is maximal, i.e. 1 (with *absolutely*):

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[2]Cf. Thomas (2014) on restricting speech act modifiers to modify only specific speech act operators.

(10) a. *[Probably(Assert)] (John is a thief)* (c)
      b. $\iota c'$: $c'=< c_{sp}, c_h, c_t, c_w \cap \{w: \exists d\ d> 0.5 \wedge ASSERT(John\ is\ a\ thief)(d)(c)\} >$

(11) a. *[Absolutely (Assert)] (John is a thief)* (c)
      b. $\iota c'$: $c'=< c_{sp}, c_h, c_t, c_w \cap \{w: \exists d\ \mathbf{d=}\ d=max(S_G) \wedge ASSERT(John\ is\ a\ thief)(d)(c)\} >$

Finally, the third move leads to a covert speech act level *POS* (cf. Kennedy and McNally (2005)), as in (12) and (13), fixing the contextually relevant standard of credence a speaker has towards the proposition he/she asserts. This 'semanticizes' ideas in e.g. Davis et al. (2007), that the 'quality threshold' of credence in assertions is not always necessarily 1, and that it can vary in context. To give an example, the degree of credence needed to justify the assertion that John is a thief can change depending on whether the speaker makes his assertion as part of a causal conversation in a pub or as part of a testimony in court:

(12) $[[POS]]^{g,w}$: $\lambda G.\ \lambda p.\lambda c.\ \iota c'$: $c'=< c_{sp}, c_h, c_t, c_w \cap \{w: \exists d\ d \geq stand(G,C) \wedge G(p)(d)(c)\} >$

(13) a. *[POS (Assert)] (John is a thief) (c)*
      b. $\iota c'$: $c'=< c_{sp}, c_h, c_t, c_w \cap \{w: \exists d\ d \geq stand(ASSERT,C) \wedge Assert\ (John\ is\ a\ thief)(d)(c)\} >$

3. Meeting the first challenge: *legamrey$_{resp}$* as an anaphoric degree modifier of assertions

We now propose that *legamrey$_{resp}$* acts as a degree modifier of gradable *ASSERT*, which maximizes the credence of the speaker in the asserted proposition, similarly to the modal adverb *absolutely*. Unlike this adverb, though, which can modify an assertion of an overt proposition (as in *John is absolutely a theif*), *legamrey$_{resp}$* can only be used as a response particle, where the asserted proposition is anaphoric to a proposition asserted / questioned in a previous turn in the discourse. This is captured in the entry for *legamrey$_{resp}$* in (14) where p_c is a contextually salient proposition:

(14) $[[legamrey_{resp}]]^{g,w}$: $\lambda\ G.\ \lambda p_C.\lambda d.\ \lambda c.\ \iota c'$: $c'=< c_{sp}, c_h, c_t, c_w \cap \{w:\ d=max(S_G) \wedge G(p_C)(d)(c)\} >$

For example, in the dialogue in (15), A's apparently unmodified assertion is actually modified by the covert *POS*, indicating that A's degree of credence in *John is a thief* is at least as high as the contextually supplied standard of credence. Then, B's response with *legamrey* indicates that his own degree of credence in this proposition is maximal:

(15) A: a. John is a thief
      b. [POS (*ASSERT*)] (John is a thief)
      B: a. *legamarey*!
      b. [*legamrey*(*ASSERT*)] (John is a thief$_c$)

This suggestion now captures both the similarities and the differences between *legamrey_resp* and *legamrey_prop*: In both its uses *legamrey* is a degree modifier of a gradable expression, which indicates that the degree of the measured entity is at the maximal endpoint of the relevant scale. However, while *legamrey_prop* modifies upper closed gradable adjectives and maximizes the degrees of individuals on e.g. a fullness / cleanness / dryness scale, *legamrey_resp* modifies a covert gradable *ASSERT* operator, associated a credence scale and maximizes the degree that the speaker believes in an anaphoric proposition. Since the credence scale has been taken to be Upper-closed (cf. Lassister (2016)), *legamrey_resp* is felicitous even when responding to assertions of propositions whose main predicate has an open scale, or is not gradable at all.[3]

4. The second challenge: *legamrey_resp* compared to two other response particles in Hebrew.

In this section we turn to compare *legamrey_resp* with two other response particles in Hebrew, namely *ken* and *naxon*. The former is the unmarked positive response particle in Hebrew, which is similar (though as we will see below, not identical) to English *yes*, and the latter is similar to English *right*). As can be seen in (16)-(18) *legamrey_resp* shares properties with both of these response particles, but is not identical to either of them

(16) A: dani ba-bayit
Danny in-the-house
'Danny is home'
B: a. legamrey b. ken c. naxon

(17) A: ha'im dani ba-bayit
Whether Danny in-the-house

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[3]The assumption that the credence degree is Upper-closed immediately raises a question regarding dialogues as in (15). We argued that A's assertion is modified by *POS*, indicating a contextually supplied standard of credence in the asserted proposition, and that B's use of *legamrey_resp* indicates that a maximal degree of credence of this proposition. However, if the standard in the case of Upper-closed adjectives is always at the maximal endpoint of the scale, as argued in e.g. Kennedy and McNally (2005), then it is not clear what the contribution of *legamrey_resp* is. Notice, though, that a parallel challenge is posed in dialogues like (i), where *completely* modifies an upper-closed adjective (cf. (Rotstein and Winter 2004)):

(i) A: Is the cup pos full?
B: Completely / It is completely full

There are several directions to take regarding such data. One is to deny the assumption that the standard for e.g. *full* is necessarily at the maximal endpoint, and to assume instead that it can be located at an upper interval of the scale (cf. Rotstein and Winter (2004)). Another is to assume that *completely* actually indicates a maximal degree of precision (cf. Burnett (2014)) regarding the maximal endpoint degree. We postpone discussion of such options to future research but suggest that the challenge with *legamrey_resp* should receive a parallel solution.

'Is Danny home?'
B: a. legamrey b. ken c.??naxon

(18)   A (to C): ha'im dani ba-bayit
         Whether Danny in-the-house
         'Is Danny home?'
         B (to C): im #legamrey / ken / #naxon, tikra lo
         If #legamrey / ken / #naxon call him
         'If #legamrey / ken / #naxon call him'

We can see, then, that *legamrey* behaves like *ken* and *naxon* in felicitously responding to assertions but that it differs from both of them when we compare its behavior in responding to polar questions and in being an antecedent of a conditional: Like *ken*, but unlike *naxon* *legamrey_{resp}* is felicitous in the former. Like *naxon* and unlike *ken* it is infelicitous in the latter. How can this varied pattern be explained?

5.   The Hebrew response particles *ken* and *naxon* in light of Krifka's 2013 anaphoric analysis of *ja* and *right*

We follow here Krifka's (2013) anaphoric view of response particles. Krifka assumes that various anaphoric elements (e.g. *it*, *so*, *that*) can pick out event, proposition and speech acts discourse referents, denoted by vPs, TPs and ActPs, as in (19a,b,c) respectively:

(19)   Ed stole a cookie.
         a. Bill saw it ('it' is anaphoric to an event denoted by the vP)
         b. Bill knows it ('it' is anaphoric to a proposition, denoted by the TP)
         c. That's a lie ('it' is anaphoric to an assertion speech act, denoted by the ActP)

Response particles, according to Krifka (2013) are also anaphoric. For example, *yes* is anaphoric to a proposition, denoted by a TP introduced in a previous move in the discourse, and then (re-)asserts it. Hence *yes* itself is an ActP:

(20)   *yes* picks up salient propositional discourse referent d and asserts it: $[\![[\text{ActP } yes]]\!]$
         = ASSERT(d)

Krifka suggests that while German *ja* is also anaphoric to a propositional discourse referent, it is different from English *yes*, in being a TP and not an ActP, i.e. its lexical entry does not include the assertion of this proposition. A construction supporting this contrast between *yes* and *ja*, according to Krifka, is the antecedents of conditionals, which can host a TP but not an ActP, and in which *ja*, but not *yes*, is felicitous:

(21)   a. Did Ede steal a cookie? If ??yes, he must give it back.
         b. Hat Ede einen Keks gestohlen? Wenn ja, muss er ihn zurückgeben.

Ja, then, is a TP which is anaphoric to a propositional discourse referent. This proposition can be then (re-)asserted by a speaker:

(22) $[\![_{ActP} \text{ ASSERT } [_{TP} \text{ ja}]]\!] = \text{ASSERT}([_{TP} \text{ ja}]) = \text{ASSERT(d)}$

Finally, Krifka suggests that *right* "[does] not take up a propositional discourse referent, but rather the discourse referent introduced by a speech act, and evaluate it as being justified. . . ." For example, when responding to an assertion of a proposition it indicates that "the speech act was justified, e.g. that the speaker would also commit to the asserted proposition. Krifka adds that this is why *right* is odd as a response to (non-biased) questions, since "all that [it] could mean in this context is that the act of posing the questions was justified".[4]

In light of Krifka's ideas and diagnostics, we suggest now that Hebrew *ken* is similar to German *ja*, and not to English *yes*, in being a TP (and not an ActP) anaphoric to a salient proposition, which can then be (re-)asserted. This is supported by the felicity of *ken* in antecedents of conditionals, as in (18) above. We suggest that *naxon* is just like *right*, i.e. it is anaphoric to a speech act. This is supported both by its infelicity in antecedents of conditionals (18), as well as by its oddness as a response to a polar question (17).

6.   Meeting the second challenge: *legamrey*$_{resp}$ as a member of the typology of response particles in Hebrew

We are now in a position to explain the similarities and the differences between *legamrey*$_{resp}$, *ken* and *naxon* described in section 4.

(16) shows that all three particles are felicitous as responding to assertions. This fact is already explained for both *ken* and *naxon*, following Krifka's ideas in section 5. Notice that despite this similarity in felicity, *legamrey*$_{resp}$ is still different from *ken* and *naxon* in that the latter do not induce any intensification effects. To explain that all we have to add to the Krifka-style analysis of *ja/ken* and *right/naxon* is that B uses the same degree of credence towards the asserted proposition as assumed in A's original assertion. For l*legamrey*$_{resp}$ we assume the analysis in section 3 above, namely that this particle modifies the assertion of an anaphoric proposition, indicating that the speaker's credence in this proposition is maximal. *legamrey*$_{resp}$, then, raises the degree of credence used by the first speaker.

(17) shows that when responding to polar questions, *legamrey*$_{resp}$ behaves like ken, being a felicitous response, and not like *naxon* which is infelicitous. Krifka's (2013) explanation for the infelicity of *right* in such cases was already applied for naxon at the end of the previous section. The felicity of ken in this environment is also rather easily explained: ken is anaphoric to a proposition, in this case the one questioned by A, and then there is no problem for its user to assert it. As to *legamrey*$_{resp}$, similarly to the reaction to assertions, here too it modifies an assertion, but this time not an assertion of a previously asserted proposition, but of a previously questioned one. Here the user of *legamrey*$_{resp}$ indicates that his / her degree of credence of the questioned proposition is maximal.

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[4]Cf. Wiltschko (2017) who shows that such responses, justifying speech acts, are attested.

Finally, we can now also understand why in antecedents of conditionals, (18), *legamrey$_{resp}$* is different from *ken* and similar to *naxon*: Following Krifka's (2013) ideas, this environment allows propositions, denoted by TPs, but not speech acts, denoted by ActP. Since ken denotes a TP, like *ja*, it is fine in this position. Since *naxon* denotes an ActP, it is not. Now *legamrey$_{resp}$* itself does not denote an ActP, but since it is a (degree) modifier of a speech act, whenever it is present an ActP must be present as well, banning its appearance in antecedents of conditionals.

7.   Conclusion and directions for future research

In this paper we proposed a compositional analysis of Hebrew response particle *legamrey$_{resp}$* as a degree modifier of the speech act operator *ASSERT*, maximizing the degree of credence its user has of a proposition which is anaphoric to another proposition asserted / questioned before. The analysis allowed us to explain a number of similarities and differences between *legamrey$_{resp}$* and two distinct types of expressions, namely: standard degree modifiers (like *completely* or *legamrey$_{prop}$*), and response particles, like *yes*, *ja*, *right*, and Hebrew *ken* and *naxon*.

In future research we would like to examine whether our analysis of *legamrey$_{resp}$* can be applied to other response particles cross linguistically which are used to increase, as well as to decrease, degrees of credence. We would also like to compare such particles with other syntactic and intonational means which were argued to induce decreased certainty / commitment (cf. raising declaratives), as well as with intensifying discourse particles, which do not necessarily increase degrees of epistemic certainty (e.g. discourse *totally* in Beltrama (2018)). In addition, we would like to compare the anaphoric-based approach of response particle we used to analyze *legamrey$_{resp}$* with other approaches, e.g with a feature-based approach to polarity particles (Farkas and Roelofsen 2015), and with an ellipsis-based theory (e.g. Kramer and Rawlins (2012), Holmberg (2016), cf. also Goodhue and Wagner (2018)). An important type of data relevant for such a comparison is the behavior of *legamrey$_{resp}$* (relative to other response particles) as responses to negative assertions and questions. We hope to examine this data too in future research.

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