Mu'tah Lil-Buhuth wad-Dirasat, Humanities and Social Sciences Series, Vol. 37 No.5 , 2022.
http: 10. 35682/0062-037-002-001

# Negative Concord in Karak Jordanian Arabic: A Bidirectional Optimality-Theoretic Account

**Safa' Al-Qatawneh***

**Atef Alsarayreh**

## Abstract

The study investigates the interpretation and distribution of n-words in Karak Jordanian Arabic. Karak Jordanian Arabic is considered a special case among other Negative Concord languages because it exhibits both strict and non-strict n-words at the same time. Previous accounts of Negative Concord in Arabic and other languages suffer the problem of capturing the special case of languages like Karak Jordanian Arabic that exhibit a mixed case of strict and non-strict Negative Concord. The current study attempts to extend Swart's (2006, 2010) Optimality-Theoretic approach of Negative Concord to Karak Jordanian Arabic. The study shows that Optimality Theory can account for the facts surrounding the interpretation and distribution of Negative Concord in Karak Jordanian Arabic. We assume that n-words in Karak Jordanian Arabic are semantically negative in contrast to some previous accounts that take n-words to be only formally negative. The study also shows that advanced versions of Optimality Theory, namely Bidirectional and Stochastic Optimality Theory, provide straightforward answers for why n-words seem to lose their negative force in Negative Concord constructions, and why languages like Karak Jordanian Arabic have both strict and non-strict n-words.

**Keywords**: Negative concord, n-words, Optimality theory, Karak Jordanian Arabic

---

* كلية الآداب، جامعة مؤتة.

تاريخ تقديم البحث: 2020/10/11م. تاريخ قبول البحث: 2020/12/3م .

# إتساق النفي في اللهجة العربية الأردنية لأهل الكرك:

# دراسة من وجهة نظر نظرية الخيار الأمثل ثنائية الاتجاه

**صفاء القطاونة**

**عاطف الصرايرة**

## ملخص

تهدف الدراسة إلى البحث في التوزيع النحوي والدلالي لكلمات النفي في اللهجة العربية الأردنية لأهل الكرك. تعتبر اللهجة العربية الأردنية لأهل الكرك حالة خاصة من بين اللغات التي تتواجد فيها ظاهرة اتساق النفي وذلك لأنها تحتوي على كلمات نافية مقيدة بوجود أداة نفي في الجملة وكلمات نافية أخرى شبه مقيدة بوجود أداة نفي في الجملة. وتهدف كذلك هذه الدراسة إلى البحث في ظاهرة اتساق النفي في اللهجة العربية الأردنية لأهل الكرك ضمن إطار نظرية الخيار الأمثل كما قدم لها زوارتس (2006، 2010). تفترض الدراسة أن كلمات النفي في اللهجة العربية الأردنية لأهل الكرك نافية في معناها وذلك على خلاف غيرها من الدراسات التي تعتبر هذه الكلمات نافية في شكلها فقط. كما تبين الدراسة أن بعض النظريات المتقدمة التي انبثقت عن نظرية الخيار الأمثل مثل نظرية الخيار الأمثل ثنائية الاتجاه ونظرية الخيار الأمثل عشوائية المتغيرات، تقدم إجابة واضحة لظاهرة فقدان كلمات النفي لمعنى النفي وظاهرة اللغات التي تحتوي على كلمات نفي مقيدة وشبه مقيدة في نفس الوقت مثل اللهجة العربية الأردنية لأهل الكرك.

**الكلمات الدالة:** ظاهرة اتساق النفي، الكلمات النافية، نظرية الخيار الأمثل، اللهجة العربية الأردنية لأهل الكرك

## 1. Negative Concord

Negative Concord (NC hereafter) refers to the phenomenon whereby two negative constituents contribute one semantic negation to the interpretation. Consider the following example from Italian**:**

(1) Italian (Penka, 2011: 14)
Maria **non** ha visto **nessuno**.
Maria **SN** has seen **nobody**
'Maria hasn't seen anybody.'

The sentence above contains two negative elements which are the negative indefinite *nessuno* and the sentential negative marker (SN hereafter) *non*; however, the interpretation includes only one semantic negation. It seems that only the SN *non* is responsible for the negative interpretation. *Nessuno* seems not to contribute negation to the interpretation although it can be used as a negative fragment answer on its own as shown in the following example.

(2) Italian (Zanuttini, 1991:16)
A: Chi hai visto?
who have seen
'who have you seen?'

B: **Nessuno.**
**nobody**
'Nobody.'

Expressions like *nessuno* are called n-words after Laka (1990) because most of these words begin with the affix *n-* in European languages. N-words can provide negative fragment answers on their own, but they fail to contribute semantic negation to the interpretation when they are accompanied by another negative constituent.

Two types of NC languages have been identified in the previous literature. These include strict NC languages and non-strict NC languages after Giannakidou (1998, 2000). Strict NC languages require that an n-word must always co-occur with an SN; that is, the presence of the SN is obligatory in strict NC languages whether the n-word occurs in a post-verbal position or in a preverbal position as shown in example (3) from Polish.

(3) Polish (Błaszczak 2001: 217)

a. *(nie) wyjechało **żadne** dziecko na wakacje.
**SN** went **no** child on holiday
'No child went on holiday.

b. **Żadne** dziecko *(**nie**) wyjechało na wakacje.
**no** child **SN** went on holiday
'No child went on holiday.'

In non-strict NC languages, on the other hand, when an n-word occurs in a post-verbal position, it must co-occur with an SN. But, when an n-word occurs in a pre-verbal position, it must not be accompanied by an SN. Consider example (4) from Italian.

(4) Italian (Zanuttini 1991: 108, 111)

a. *(**non**) ho visto **nessuno**.
**SN** have seen **nobody**
'I haven't seen anybody.'

b. **Nessuno** (*non) ha visto Mario.
**nobody SN** has seen Mario
'Nobody saw Mario.'

It is important to note at this point that in non-strict NC languages, such as Italian, preverbal n-words may co-occur with an SN, but the interpretation will yield double negation reading rather than an NC reading as shown in the following example from Italian.

(5) Italian (Penka 2011:19)
**Nessuno non** ha mangiato.
**nobody SN** has eaten
'Nobody didn't eat.' (= 'Everyone ate.')
'*Nobody ate.'

The reader might have noticed that all of the examples of NC discussed above include NC constructions that involve an SN and an n-word. Those constructions are called Negative Doubling constructions (Den Besten 1986; Van der Wouden & Zwarts 1993; Van der Wouden 1997; Zeijlestra 2004; Alsarayreh 2012). Negative concord might also take another form with an n-word co-occurring with another n-word as in the following example from Italian.

(6) Italian: (Zeijlstra 2004: 62)
**Nessuno** ha telefonato a **nessuno**
**nobody** has telephoned to **nobody**
'Nobody called anybody.'

In (6), we notice that when an n-word co-occurs with another n-word, it fails to contribute negation to the interpretation, which means that the sentence has an NC reading. This form of NC is called Negative Spread (Den Besten 1986; Van der Wouden & Zwarts 1993; Van der Wouden 1997; Zeijlestra 2004; Alasrayreh 2012).

## 2. Negative Concord in Karak Jordanian Arabic

The study intends to investigate NC in Karak Jordanian Arabic (KJA hereafter). KJA is the dialect spoken in the Governorate of Karak in the southern part of Jordan. KJA exhibits NC. KJA includes exprssions that can be used as negative fragment answers, and that seem not to contribute semantic negation to the interpretation when they are accompanied by an SN. Alsarayreh (2012) proposes that KJA exhibits strict and non-strict NC at the same time.

The adverbial n-words *bilmarrah* "never, not at all", *ʔabadan* "never, not at all", *nihāʔyyan* "never, not at all" and the not-yet-words *lahassa* "*not yet*", *laħadilʔān* "*not yet*", are strict because they must always co-occur with an SN regardless of whether they occur in a post-verbal or a preverbal position as shown in examples (7) and (8) below.

(7) KJA

a. Sāra *(**mā**)-bitħib r-rasim **bilmarrah.**
Sara **SN**-like.3SF the-drawing **never**
'Sara does not like drawing at all.'

b. **bilmarrah** Sāra *(**mā**)-bitħib r-rasim.
**never** Sara **SN**-like.3SF the-drawing
'Sara does not like drawing at all.'

(8) KJA

a. Sāra *(**mā**)-ħallat l-wādʒib **lahassa**.
Sara **SN**-did.3SF the-homework **yet**
'Sara has not done the homework yet.'

b. **lahassa** Sāra *(**mā**)-ħallat l-wāʤib
**yet** Sara **SN**-did.3SF the-homework
'Sara has not done the homework yet.'

The scalar focus particle *wala*, on the other hand, is non-strict as it must co-occur with an SN only in a post-verbal position as shown in example (9) below.

(9) KJA
a. *(**mā**)-ʤa **wala** wāħad.
**SN**-came.3SM **no** one
'no one came.'
b. **wala** wāħad (***mā**)-ʤa.
**no** one **SN**-came.3SM
'no one came.'

The preverbal non-strict n-word *wala* in KJA may co-occur with an SN and the interpretation in such case will take a double negation reading rather than an NC reading as shown in the following example.

(10) KJA
**wala** ṭālib **mā**-ħall s-suʔāl.
**no** student **SN**-answered.3SM the-question
'No student didn't answer the question.' (= 'Every student answer the question.')
*'No student answered the question.'

KJA also exhibits Negative Spread constructions in which an n-word co-occurs with another n-word as shown in the following examples.

(11) KJA
**wala** ṭālib ħall **wala** suʔāl.
**no** student answered.3SM **no** question
'No student answered any question.'

(12) KJA
**wala** ṭālib ħall suʔāl **bilmarrah**.
**no** student answered.3SM question **never**
'No student answered any question at all.'

Sentence (11) involves the n-word *wala* in preverbal and postverbal position and no SN. Sentence (12) involves the preverbal n-word *wala* and the postverbal n-word *bilmarrah* and no SN. In both (11) and (12), there are two negation expressions (i.e. two n-words), but the interpretation includes one instance of negation.

## 3. Theoretical Background

### *3.1 Optimality theory*

Optimality Theory (OT hereafter) is a linguistic theory which hypothesizes that the actual output of language is the result of the optimal satisfaction of competing constraints. It aims at explaining how the different possible forms of actual output are compared by breaking them down to arrive at a theoretical claim (McCarthy 2002). OT was first proposed as a theory of phonology then it was extended to syntax and semantics. OT, like other theories of Generative Grammar, addresses language principles, typologies, and acquisition. Unlike other theories of grammar, OT proposes that phonology is regulated by constraints rather than rules. It looks at grammar as mappings between inputs and outputs. According to OT, the inputs represent underlying representations, and the outputs represent their surface realizations. The main components of OT are:

- **Generator (GEN)** which is responsible for taking an input and generating the list of possible outputs or candidates,
- **Constraint (CON)** which offers strictly violable ranked constrains as criteria by which we decide between candidates, and
- **Evaluator (EVAL)** which chooses the optimal candidate based on the constraints, and this candidate is the output.

According to OT, these components exist for all languages with no language-specific restrictions. It assumes that differences between languages in grammars are due to the different ranking of the universal constraints; that is, each language gives priorities to some constraints over others (Kager 1999). The ranking of constraints determines which of the candidates will be assessed as optimal by EVAL. There are two basic types of constraints in OT:

- **Faithfulness constraints** which do not impose any kind of change in the form of the input, which means that these constraints require identity between the observed surface form (i.e. the output) and the underlying form (i.e. the input).
- **Markedness constraints** which impose some kind of change in the form of the input.

The basic concepts of OT include:
- **Optimality**: an optimal output is one that incurs less violations than other candiadtes on a set of hierarchically ranked constraints.
- **Domination**: higher-ranked constraints are more powerful than lower-ranked constraints and they preceded them in ranking.

If two candidates, A and B, compete on a constraint, A wins over B if A incurs fewer violations of the constraint than B. If A and B compete on an entire constraint hierarchy, A wins over B if A doesn't incur a violation for the highest-ranking constraint or if it makes fewer violations of the highest-ranked constraint than other competing candidates. In other words, A is "optimal" and wins over all its candidate set if it incurs fewer violations on the constraint hierarchy than all other candidates. The competition between output candidates is often represented with a tableau with the constarints in horizontal descending order from left to right and the candidates in a random vertical order as illustrated in tableau (1) (Kager 1999).

**Tableau (1): An illustrative tableau showing how OT works (using two constraints)**

| **Input** | **CONSTRAINT 1 ($C_1$)** | **CONSTRAINT 2 ($C_2$)** |
|---|---|---|
| **A. ☞ Candidate A** | | * |
| **B. Candidate B** | *! | |

In the tableau above, we have two constraints ($C_1$ and $C_2$), and $C_1$ dominates $C_2$ ($C_1 \gg C_2$). The pointing hand symble signals the optimal candidate, and the asterisk (*) indicates each violation of a certain candidate for a given constraint. Candidate A is optimal because it has no violations of the higher-ranked constraint ($C_1$). Candidate B has a violation of the higher-ranked constraint ($C_1$) and the exclamation mark (!) added to the asterisk shows that this violation is fatal. The shaded cells represent lower-ranked constraints which do not take part in the competition for optimal candidacy.

If we have three constraints ($C_1$, $C_2$, and $C_3$), and $C_1$ dominates $C_2$, which, in turn, dominates $C_3$ ($C_1 \gg C_2 \gg C_3$), A is optimal if it does better (i.e has less violations) than B on the highest ranking constraint. If both A and B perform equally well on $C_1$, but A performs better than B on $C_2$, A is optimal, even if A incurs more violations of $C_3$ than B does. Consider tableau (2) below.

**Tableau (2): An illustrative tableau showing how OT works (using three constraints)**

| Input | CONSTRAINT 1 | CONSTRAINT 2 | CONSTRAINT 3 |
|---|---|---|---|
| **A. ☞ Candidate A** | * | * | *** |
| **B. Candidate B** | * | **! | |

When a candidate incurs more violations than another candidate on a highest ranking constraint, it will be excluded from the competition for the optimal candidate as it has a fatal violation. When a candidate incurs a fatal violation, it cannot be optimal, even if it outperforms the other candidates on the rest of the constraints.

For more illustration, we will provide an example showing a phonetic contrast between oral and nasal vowels in English. In English, vowels are originally oral but when they precede a nasal stop, they become nasal. Consider tableau (3) below.

**Tableau (3): A simple example of how OT works (kager 1999: 31)**

| Input: /sæd/ | *VORALN | *VNASAL | IDENT-IO (NASAL) |
|---|---|---|---|
| **A. ☞ [sæd]** | | | |
| **B. [sæ̃d]** | | *! | * |

In tableau (3) above, candidate (A) is the optimal one because it does not violate any constraint. It supports the constraint (*$V_{ORAL}$N) which asserts that vowels must not be oral when they occur before a nasal stop (i.e they must be nasal). Candidate (A) also supports the constraint (*$V_{NASAL}$) which asserts that vowels must not be nasal regardless of their position in the syllable (i.e whether they are before an oral or a nasal sound) which means that they must be only oral. The constraint ($I_{DENT}$-IO ($_{NASAL}$)) asserts that input and output agree in nasality which is supported by candidate (A). Candidate (B), on the other hand, which contains a nasal vowel, violates the markedness constraint (*$V_{NASAL}$) and it also violates the constraint ($I_{DENT}$-IO ($_{NASAL}$)) because the vowel in it does not match its oral correspondent in the input (i.e the input and the output do not agree in nasality).

*3.2 Bidirectional Optimality Theory*

Bidirectional Optimality Theory (BiOT hereafter) deals with studying the syntax-semantics interface. For example, for the form-meaning pair $\langle f, m\rangle$, if '$\langle f', m\rangle > \langle f, m\rangle$', then ($f'$) is more harmonic for ($m$) than ($f$); and if '$\langle f, m'\rangle > \langle f, m\rangle$', then ($m'$) is more harmonic for ($f$) than ($m$). BiOT proposes that natural language comprehension determines which form-meaning pair is optimal. According to Benz and Mattausch (1984: 9), this strategy includes the assumption that a form-meaning pair ($f$, $m$) is bidirectionally optimal (i.e $f$ is optimal for $m$ and $m$ is optimal for $f$) iff:

a. there is no distinct pair ($f'$, $m$) such that ($f'$, $m$) > ($f$, $m$)
b. there is no distinct pair ($f$, $m'$) such that ($f$, $m'$) > ($f$, $m$)

(a) and (b) are parts of the BiOT strategy. They present restrictions on optimal form-meaning pairs so that a less harmonic form for expressing a particular meaning is blocked thus making a more harmonic form available for it.

For more illustration, consider diagram (1) which includes two meanings ($m^1$) and ($m^2$) and three forms ($f^1$), ($f^2$), and ($f^3$), a generative constraint ($C_G$) which represents penalized forms with respect to various meanings, and an interpretational constraint ($C_I$) which represents penalized interpretations with respect to given forms.

Diagram (1): An illustrative diagram showing how BiOT works (Benz and Mattausch 1984:10)

| $f^1$ | $C_I$ |
|---|---|
| ☞ $m^1$ | |
| $m^2$ | *! |

| $m^1$ | $C_G$ |
|---|---|
| ☞ $f^1$ | |
| $f^2$ | *! |
| $f^3$ | *! |

| $f^2$ | $C_I$ |
|---|---|
| $m^1$ | *! |
| ☞ $m^2$ | |

| $m^2$ | $C_G$ |
|---|---|
| $f^1$ | *! |
| ☞ $f^2$ | |
| $f^3$ | *! |

| $f^3$ | $C_I$ |
|---|---|
| ☞ $m^1$ | |
| $m^2$ | *! |

According to diagram (1) above, *($f^1$)* is optimal for *($m^1$)* and *($m^1$)* is optimal for *($f^1$)* (i.e they are bidirectionally optimal), and ($f^2$) and ($m^2$) are also optimal for each other. On the other hand, ($f^3$), while ($m^1$) is optimal for it, is not an optimal output for any of the inputs. This means that $\langle f^1, m^1 \rangle$ and $\langle f^2, m^2 \rangle$ are bidirectionally optimal pairs, whereas ($f^3$) is not a member of any bidirectionally optimal pair and thus is disqualified as the output for any (intended) meaning.

## 4. NC in Optimality Theory

The study adopts the ideas proposed by de Swart (2006, 2010) for the analysis of n-words in natural languages within the framework of BiOT. The study mainly intends to see whether Swart's BiOT analysis of NC may extend to KJA.

### *4.1 Generation and Interpretation of Propositional Negation in BiOT:*

Swart (2006, 2010) proposes two constraints that regulate how negation works in natural languages. These constraints are FaithNeg and *Neg.

(13) **FaithNeg**: reflect the nonaffirmative nature of the input in the output.

(14) ***Neg**: avoid negation in the output.

FaithNeg is a faithfulness constraint, whereas *Neg is a markedness constraint, which means that FaithNeg is in conflict with *Neg. Negation is regulated for both the speaker (during generation) and the listener (during interpretation) by the ranking of these conflicting constraints. If FaithNeg outranks *Neg (i.e. FaithNeg >> *Neg), the negative meaning of the sentence will be expressed in the form. The tendency in natural languages is to mark negative sentences and not affirmative ones (Haspelmath, 1997). Therefore, the ranking (FaithNeg >> *Neg) is assumed to be adopted because of the fact that in all languages negative sentences are marked (i.e. when the meaning includes negation, it must be marked in the form). Consider tableau (4) below with examples from English and KJA.

**Tableau (4): Generation of negative sentences**

| **Meaning**: (¬p) | **FaithNeg** | ***Neg** |
|---|---|---|
| **Form 1**: (S)<br>- e.g. English:<br>Jack is tired.<br>- e.g. KJA:<br>Rāmi ʤa.<br>Rami came.3SM<br>'Rami came.' | *! | |
| ☞**Form 2:** (not S)<br>- e.g. English:<br>Jack is **not** tired.<br>- e.g. KJA:<br>Rāmi **mā**-ʤa.<br>Rami **SN**-came.3SM<br>'Rami didn't come.' | | * |

In tableau (4) above, we note that the input is a meaning and the output candidates are forms. It shows how the ranking of FaithNeg and *Neg generates propositional negation. In this tableau, the ranking (FaithNeg >> *Neg) leads to (form 2) to be the optimal candidate which reflects the nonaffarmative nature of the input. The optimal candidate for the meaning "¬*Jack tired*" in English is the form "*Jack is not tired*"; and the optimal candidate for the meaning "¬*Rāmi ʤa*" in KJA is "*Rāmi ma-ʤa*". Tableau (5) below illustrates the interpretation of propositional negation.

**Tableau (5): Interpretation of negative sentences**

| **Form:** (not S) | **FaithNeg** | ***Neg** |
|---|---|---|
| **Meaning 1**: (P)<br>- e.g. English:<br>Jack is tired.<br>- e.g. KJA:<br>Rāmi ʤa.<br>Rami came.3SM | *! | |
| ☞**Meaning 2:** (¬p)<br>- e.g. English:<br>¬Jack is tired<br>- e.g. KJA:<br>¬Rāmi ʤa.<br>¬Rami came.3SM | | * |

In tableau (5) above, we note that the input is a form and the output candidates are meanings. It shows how the ranking of FaithNeg and *Neg interprets propositional negation. In this tableau, the ranking (FaithNeg >> *Neg) leads to (meaning 2) to be the optimal candidate which reflects the nonaffarmative nature of the input. Therefore, the optimal candidate for the form "*Jack is not tired*" in English is the meaning "*¬Jack tired*"; and the optimal candidate for the form "*Rāmi mā-ʤa*" in KJA is the meaning "*¬Rāmi ʤa*".

*4.2 Generation and Interpretation of NC in BiOT*

Natural languages employ three forms to express the meaning $\neg\exists x_1 \exists x_2 \ldots \exists x_3$ (Haspelmath 1997, Corblin and Tovena 2003). The simplest possible form used is the combination of an SN or a negative quantifier and an indefinite in its scope as shown in the following examples from Dutch.

(15) Dutch (Swart 2004: 4)

a. Ik heb daar toen **niet iets** van durven zeggen.
I have there then **not something** dare say.
'I didn't dare to say anything about that at that time.'

b. **Niemand** heft **iets** gezien.
**Nobody** has **something** seen.
'Nobody saw anything.'

KJA does not allow for this form because indefinite pronouns in the language are Positive Polarity Items (PPIs hereafter) that are ungrammatical in the scope of negation as shown in the following examples.

(16) a. Rāʃid **mā-**ʃtara **ʃaɤlah**.
Rashid **SN**-bought.3SM **thing**
'There is something that Rashid didn't buy.'
'*There isn't something that Rashid didn't buy.'

b. **mā**-ħada ʃtara **ʃaɤlah**.
**SN**-one bought.3SM **thing**
'There is something that no one bought.'
'*There isn't something that no one bought.'

Sentence (16a) includes the SN *mā-* ‘not’ and the indefinite pronoun *ʃaɤlah* ‘thing’. Sentence (16b) includes the negative quantifier *mā-ħada* ‘no one’ and the indefinite pronoun *ʃaɤlah*. Both sentences fail to express existential quantification under negation as both sentences can be grammatical only with the indefinite taking scope above negation. Therefore, KJA employs other types of indefinites to express the intended meaning of an indefinite in the scope of negation. These include Negative Polarity Items (NPIs hereafter) and n-words as shown in (17) and (18) respectively below.

(17) a. Rāʃid **mā-**ʃtara **iʃi**.
Rashid **SN**-bought.3SM thing
‘Rashid didn’t buy anything.’

b. **wala** ṭālib ʃtara **iʃi**.
**no** student bought.3SM **thing**
‘No student bought anything.’

(18) a. Rāʃid **mā-**ʃtara **wala** ʃaɤlah.
Rashid **SN**-bought.3SM **no** thing
‘Rashid didn’t buy anything.’

b. **wala** ṭālib ʃtara **wala** ʃaɤlah.
**no** student bought.3SM **no** thing
‘No student bought anything.’

*4.3 Generation of N-words in BiOT*

This section addresses how OT accounts for the generation of n-words in natural languages. It has already been noticed in the literature that n-words are used in natural languages to mark negative variables (i.e. to indicate that an argument is interpreted in the scope of negation (Corblin and Tovena 2003: 326), or to mark the focus of negation (Haspelmath 1997: 231). OT captures this tendency in natural languages by the faithfulness constraint MaxNeg:

(19) **MaxNeg**: Mark all negative variables. (i.e., mark all arguments that are interpreted in the scope of negation)

However, not all natural languages have n-words that they use to express existential quantification under negation as we have noticed in the previous section. Some languages use n-words, others use simple indefinites or NPIs. Some languages use both NPIs and n-words for this purpose. OT captures this variation between natural languages in the expression of the meaning of existential quantification under negation by means of conflicting constraints. The constraints involved here are the faithfulness constraint MaxNeg and the markedness constrain *Neg. If *Neg outranks MaxNeg, we will get a language that expresses existential quantification under negation by means of indefinite pronouns as illustrated in Tableau (6) below. If MaxNeg outranks *Neg, we will get a language that expresses existential quantification under negation by means of n-words as illustrated in Tableau (7) below. In those tableaux and throughout the entire study, *indef* stands for indefinite pronouns and *neg* stands for negative quantifiers and n-words. The issue of how OT can account for the generation of NPIs to express existential quantification under negation will not be discussed in this study.

**Tableau (6): Generation of indefinites**

| **Meaning**: $\neg\exists x_1 \exists x_2$ | **FaithNeg** | ***Neg** | **MaxNeg** |
|---|---|---|---|
| **Form 1:** indef + indef<br>e.g. KJA:<br>***ʃaɤlah** ʃtarat **ʃaɤlah**.<br>**thing** bought.3SF **thing**<br>'Something bought something.' | *! | | ** |
| ☞**Form 2:** neg + indef<br>e.g. KJA:<br>#**wala** ṭālib ʃtara **ʃaɤlah**.<br>**no** student bought.3SM **thing**<br>'No student bought anything.' | | * | * |
| **Form 3:** neg + neg<br>e.g. KJA:<br>**wala** ṭālib ʃtara **wala** ʃaɤlah.<br>**no** student bought.3SM **no** thing<br>'No student bought anything.' | | **! | |

**Tableau (7): Generation of n-words**

| **Meaning**: $\neg\exists x_1 \exists x_2$ | **FaithNeg** | **MaxNeg** | ***Neg** |
|---|---|---|---|
| **Form 1:** indef + indef<br>e.g. KJA:<br>***ʃaɤlah** ʃtarat **ʃaɤlah**.<br>**thing** bought.3SF **thing**<br>'Something bought something.' | *! | ** | |
| **Form 2:** neg + indef<br>e.g. KJA:<br>#**wala** ṭālib ʃtara **ʃaɤlah**.<br>**no** student bought.3SM **thing**<br>'No student bought anything.' | | *! | * |
| ☞**Form 3:** neg + neg<br>e.g. KJA:<br>**wala** ṭālib ʃtara **wala** ʃaɤlah.<br>**no** student bought.3SM **no** thing<br>'No student bought anything.' | | | ** |

Tableau (6) shows that the optimal output candidate for expressing existential quantification under negation is the form (neg+indef) which is not attested in KJA. Tableau (7), on the other hand, shows that the optimal candidate for expressing the intended meaning is (neg+neg) which is attested in KJA.

*4.4 Negative Concord and Double Negation in BiOT*

Natural languages are divided into NC languages in which more than one negative element occurs in a sentence but the sentence is interpreted as only being negated once such as Arabic, and double negation (DN hereafter) languages in which two forms of negation are used in the same sentence and the sentence is interpreted as being affirmative such as English.

According to de Swart and Sag (2002), NC arises by a resumption strategy whereas DN arises through iteration forcing. They assume that the NC reading results from a resumption process whereby two negative instances act as one and thus the sentence is interpreted as only having a single negation. The DN reading is assumed to be the result of an iteration process whereby two negative instances do not lose their negative force and thus the sentence is interpreted as an affirmative one. Swart (2006, 2010) uses the strategies of resumption and iteration in her analysis in order to account for the difference between NC languages and DN languages. She points out that resumption and iteration happen concomitantly with BiOT which has to do with the variation between NC languages and DN languages. This variation depends on the position of the constraint *Neg relative to the additional constraint IntNeg:

(20) **IntNeg**: Force iteration (i.e., interpret every neg expression in the input form as contributing a semantic negation at the first-order level in the output).

*Neg prefers resumption while IntNeg prefers iteration. If *Neg >> IntNeg, resumption applies and leads to an NC reading. The ranking IntNeg >> *Neg, on the other hand, yields a DN reading by iteration forcing. This means that NC languages adopt the ranking *Neg >> IntNeg which motivates resumption whereas DN languages have the ranking IntNeg >> *Neg which motivates iteration.

We will only discuss the semantic side because the difference between NC languages and DN languages is a matter of interpretation. In the syntactic structure, we don’t have hidden negations (i.e. both of the negative instances are formally marked), so the generation side will not be discussed here. Consider tableaux (8) and (9) below.

**Tableau (8): Double Negation (interpretation)**

| **Form:** neg + neg:<br>e.g. standard English:<br>**Nobody** ate **nothing**. | **FaithNeg** | **IntNeg** | ***Neg** |
|---|---|---|---|
| **Meaning 1:** $\exists x_1 \exists x_2$ | *! | ** | |
| **Meaning 2:** $\neg\exists x_1 \exists x$ | | *! | * |
| ☞**Meaning 3:** $\neg\exists x_1 \neg\exists x_2$ | | | ** |

**Tableau (9): Negative Concord (interpretation)**

| **Form**: neg + neg<br>e.g. KJA:<br>**wala** ṭālib ħall **wala** suʔāl.<br>**no** student answered.3SM **no** question<br>'No student answered any question.' | **FaithNeg** | ***Neg** | **IntNeg** |
|---|---|---|---|
| **Meaning 1:** $\exists x_1 \exists x_2$ | *! | | ** |
| ☞**Meaning 2:** $\neg\exists x_1 \exists x_2$ | | * | * |
| **Meaning 3:** $\neg\exists x_1 \neg\exists x_2$ | | **! | |

Tabluea (8) above shows that a sentence such as *"Nobody ate nothing"* in standard English has two negative expressions which include *nobody* and *nothing* with a DN reading. Each negative expression retains its negative force. The syntactic constraint MaxNeg has nothing to do in the interpretation, that is why it is not involved here. FaithNeg and *Neg are double-edged constraints. They play a role in both the semantic side and the syntactic side. The top ranking of FaithNeg makes the first candidate (i.e. meaning 1) excluded. (Meaning 2) is also excluded because resumption here is not motivated (*Neg is ranked below IntNeg). The constraint IntNeg is ranked higher than *Neg which motivates iteration and thus makes the third candidate (i.e. meaning 3) the optimal candidate.

In tableaux (9), the KJA sentence "*wala ṭālib ħall wala suʔāl"* has two negative expressions (a preverbal *wala* phrase and a post verbal *wala* phrase) with an NC reading by virtue of the ranking *Neg >> IntNeg. One of the negative expressions loses its negative force. (Meaning 1) is excluded because of the top ranking of FaithNeg. (Meaning 3) is also excluded because iteration here is not motivated (IntNeg is ranked below *Neg). The constraint *Neg is ranked higher than IntNeg which motivates resumption and thus makes (meaning 2) the optimal candidate.

It is important to note here that the sentence "*wala ṭālib ħall wala suʔāl*" is ambiguous between an NC reading and a DN reading. In tableau (6) above, we dealt with this sentence as one that conveys only a NC reading in spite of the fact that it has also a DN reading. We account for this ambiguity in the following section.

### *4.5 Generation and Interpretation of Negative Spread in BiOT:*

In some NC languages including KJA, when two n-words occur together they may lead to a DN reading in addition to the NC reading. For example, sentences with multiple n-words in KJA are ambiguous between two readings; one of them is negative spread (i.e. multiple n-words with an NC reading) and the other is DN (i.e. multiple n-words with a DN reading). We can account for this variation through an advanced version of OT called stochastic OT (StOT hereafter) first proposed by Boersma (1998). StOT can be used to account for the generation and interpretation of ambiguous sentences which cannot be expressed by the usual order of the conflicting constraints. In StOT, the ranking of the constraints IntNeg relative to the constraint *Neg determines which of the two different meanings is optimal depending on a certain context. We can assume that the constraints *Neg and IntNeg inherently occur in the same stratum and their order can be changed in relation to each other (*Neg <<>> IntNeg). This manipulation in the ranking of the two constraints depends on the context in which multiple n-words are used. If the speaker, during the generation process, uses a certain context for a certain sentence, the listener, during the interpretation process, will choose either an NC reading by the ranking (*Neg >> IntNeg) or a DN reading by the ranking (IntNeg >> *Neg) based on that context. Consider tableau (10) below.

**Tableau (10): Interpretation of multiple n-words in KJA**

| **Form 3:** (neg + neg)<br>e.g. KJA:<br>**wala** ṭālib ħall **wala** suʔāl.<br>**no** student answered.3SM **no** question<br>'No student answered any question.'<br>'No student answered no question.' | **FaithNeg** | ***Neg**<br>< | **> IntNeg** | **MaxNeg** |
|---|---|---|---|---|
| ☞**meaning 1:** $\neg\exists x_1 \exists x_2$ | | * | * | |
| ☞**meaning 2:** $\neg\exists x_1 \neg\exists x_2$ | | ** | | |

The sentence "*wala ṭālib ħall wala suʔāl"* is ambiguous between an NC reading and a DN reading. The first meaning is the single negation interpretation (i.e. NC reading: no student answered any question). The second meaning is the multiple negation interpretation (i.e. DN reading: every student answered some question). Tableau (10) above shows how the interpretation of the sentence "*wala ṭālib ħall wala suʔāl"* varies depending on the ranking of IntNeg relative to *Neg under different contexts determined by the speaker. If *Neg >> IntNeg, resumption applies and leads to an NC reading and thus makes (meaning 1) the optimal candidate. If IntNeg >> *Neg, iteration will be motivated yielding a DN reading making (meaning 2) the optimal candidate.

It is important to know that a sentence such as "*wala ṭālib ħall wala suʔāl"* is rare in KJA. Some people do not accept it at all because they are unfamiliar with this construction. Some others do not accept it as an ambiguous sentence because they are unfamiliar with the DN reading of it. They only accept the NC reading. As native speakers of KJA, we accept the sentence with its different readings. Furthermore, we checked with 7 native speakers of KJA using appropriate contexts that clearly show that the sentence is ambiguous and they all agreed that the sentence has two meanings. For more illustration, consider examples (21) and (22) below.

(21) **wala** maraḍ il-uh **wala** ʕilāʤ.
**no** disease to-31M **no** cure
'No disease has no cure.' = (Every disease has a cure.)

(22) **wala** wāħad ibin la-**wala** wāħad.
no one son to-**no** one
'No one is son of no one.' = (Every one is a son of someone.)

Sentences (21) and (22) are of the same structure as the sentence "*wala ṭālib ħall wala suʔāl"*. Unlike the sentence "*wala ṭālib ħall wala suʔāl"*, sentences (21) and (22) are not ambiguous. Both sentences have only a DN reading because each one of them is used under only one context to express a fact. Sentence (21) refers to the fact that every disease has some cure, and sentence (22) refers to the fact that everyone has a parent. Accordingly, sentences (21) and (22) support the idea sentences like "*wala ṭālib ħall wala suʔāl"* have a DN reading in addition to their NC reading.

### *4.6 Generation and Interpretation of strict and non-strict NC in BiOT*

BiOT can also provide an answer for the question of how strict and non-strict NC languages are different. Swart (2006, 2010) proposed the constraint NegFirst to make this distinction between strict and non-strict NC languages clear.

(23) **NegFirst**: Negation is preverbal.

In a negative construction, NegFirst encourages the use of the negative expression as early as possible in order to mark the scope of negation and to show that this construction is certainly negated (Jesperson 1933; Swart 2006, 2010). NegFirst is used to express the idea that in non-strict NC languages, post-verbal n-words must be accompanied by an SN in preverbal position, whereas preverbal n-words must not. With post-verbal n-words, we need an SN in preverbal position in order to satisfy NegFirst. With preverbal n-words, we don't need an SN as long as they are used early in the sentence because preverbal n-words in this case satisfy NegFirst. In order to account for the generation and interpretation of non-strict NC languages, we adopt the usual constraint ranking of NC languages discussed above in addition to the constraint NegFirst ranked higher than *Neg. Consider tableaux (11) and (12) below with an example from Italian.

**Tableau (11): Generation of post-verbal n-words in non-strict NC languages**

| **Meaning**: ¬V∃x | **MaxNeg** | **NegFirst** | ***Neg** | **IntNeg** |
|---|---|---|---|---|
| **Form 1:** V neg<br>e.g. Italian:<br>ho visto **nessuno.**<br>have seen **nobody**<br>'I have seen nobody.' | | *! | * | |
| ☞**Form 2:** SN V neg<br>e.g. Italian:<br>**non** ho visto **nessuno.**<br>**SN** have seen **nobody**<br>'I haven't seen anybody.' | | | ** | |

**Tableau (12): Interpretation of post-verbal n-words in non-strict NC languages**

| **Form:** SN V neg<br>e.g. Italian:<br>**non** ho visto **nessuno.**<br>**SN** have seen **nobody**<br>'I haven't seen anybody.' | **MaxNeg** | **NegFirst** | ***Neg** | **IntNeg** |
|---|---|---|---|---|
| **Meaning 1:** ¬V¬∃x | | | **! | |
| ☞**Meaning 2:** ¬V∃x | | | * | * |

Tableau (11) above illustrates that MaxNeg is not violated by any candidate as long as both of the outputs have an n-word. Its position relative to NegFirst is irrelevant because they are not in direct competition. According to the ranking NegFirst >> *Neg, the optimal candidate is (form 2) because it doesn't violate the constraint NegFirst; that is, it contains an SN in preverbal position. This means that when an n-word is post-verbal, the sentence that contains a preverbal marker of sentential negation is an optimal output.

According to tableau (12) above, the ranking *Neg >> IntNeg, makes (meaning 2) (i.e. the NC reading) the optimal candidate by virtue of resumption. Swart (2006, 2010) asserts that when resumption applies in constructions involving a preverbal SN and a post-verbal n-word, the n-word retains its negative force as long as it is linked with a variable needing to be marked while the SN is absorbed as long as it doesn't bind a variable. Note that the constraint NegFirst is added to the OT syntax and it doesn't affect the OT semantics, so it doesn't play a role in the interpretation side. This means that from now on, we focus only on the generation side.

For sentences which contain a preverbal n-word, the optimal candidate is a sentence without an SN. Consider tableau (13) below with an example from Italian.

**Tableau (13): Generation of preverbal n-words in non-strict NC languages**

| **Meaning**: ¬V∃x | **MaxNeg** | **NegFirst** | ***Neg** | **IntNeg** |
|---|---|---|---|---|
| ☞**Form 1:** neg V<br>e.g. Italian:<br>**Nessuno** ha visto Mario.<br>**nobody** has seen Mario<br>'Nobody saw Mario.' | | | * | |
| **Form 2:** neg SN V<br>e.g. Italian:<br>**Nessuno non** ha visto Mario.<br>**nobody SN** has seen Mario<br>'Nobody didn't see Mario.' | | | **! | |

As shown in tabluae (13) above, NegFirst has no violations because each one of the candidates includes an n-word (the n-word *nessuno* in the example above) that expresses preverbal negation. MaxNeg is also satisfied because in both candidates ((form 1) and (form 2)), negative variables are formally marked by the n-word *nessuno*. According to *Neg, (form 1) which lacks an SN is the optimal candidate because it includes only one negative instance (the n-word *nessuno*) in preverbal position. We conclude that the SN is excluded when an n-word occurs in preverbal position. According to tableaux (12) and (13), preverbal negation can be expressed by either an SN or an n-word.

For strict NC languages which require that the n-word must co-occur with an SN regardless of whether it occurs in a post-verbal position or a preverbal position, Swart (2006, 2010) proposes the constraint MaxSN.

(24) **MaxSN**: A negative clause must bear a sentential negative marker.

Just like the constraint NegFirst, MaxSN does not affect the semantic side as a syntactic constraint, so we will focus only on the generation side. Consider tableaux (14) and (15) below with examples from Polish.

**Tableau (14): Generation of preverbal n-words in strict NC languages**

| **Meaning**: ¬V∃x | **MaxNeg** | **MaxSN** | ***Neg** | **IntNeg** |
|---|---|---|---|---|
| **Form1:** neg V<br>e.g. Polish:<br>**Żaden** dziecko wyjechalo na wakacje.<br>**no** child went on holiday<br>‘No child went on holiday.’ | | *! | * | |
| ☞**Form 2:** neg SN V<br>e.g. Polish:<br>**Żaden** dziecko **nie** wyjechalo na wakacje.<br>**no** child **SN** went on holiday<br>‘No child went on holiday.’ | | | ** | |

**Tableau (15): Generation of postverbal n-words in strict NC languages**

| **Meaning**: ¬V∃x | **MaxNeg** | **MaxSN** | ***Neg** | **IntNeg** |
|---|---|---|---|---|
| **Form1:** neg V<br>e.g. Polish:<br>wyjechalo **Żaden** dziecko na wakacje.<br>went **no** child on holiday<br>‘No child went on holiday.’ | | *! | * | |
| ☞**Form 2:** neg SN V<br>e.g. Polish**:**<br>**nie** wyjechalo **Żaden** dziecko na wakacje.<br>**SN** went **no** child on holiday<br>‘No child went on holiday.’ | | | ** | |

Tableau (14) above shows that there is no competition between MaxNeg and MaxSN. Both of them prefer to reflect negation in the output. Their ranking relative to each other does not affect the result of which candidate is optimal as long as they both outrank *Neg. We note that, with preverbal n-words, the optimal candidate is the form containing an SN (i.e. form 2) according to MaxSN. Including the same constraints ranking, tableau (15) above, shows that with post-verbal n-words, the optimal candidate is also the one containing an SN.

According to the tableaux (14) and (15) above, we have an obligatory SN with both preverbal n-words and post-verbal n-words (i.e in both cases the optimal candidate is the form containing an SN). We note that in each tableau NegFirst is not added. Here, we have a strict NC language with a preverbal SN in which NegFirst cannot be ranked independently. There is no need to add the constraint NegFirst because it is automatically applied as it is implied in the constraint MaxSN. That is to say, if we assume that NegFirst is explicitly added to each tableau, it doesn't affect the optimality of (form 2).

For sentences with a post-verbal SN, the constraint NegFirst can be ranked independently because it is violated in such case. Consider tableau (16) with an example from Afrikaans.

**Tableau (16): Generation of postverbal markers of sentential negation in strict NC languages**

| **Meaning**: ¬V∃x | **MaxNeg** | **MaxSN** | **NegFirst** | ***Neg** | **IntNeg** |
|---|---|---|---|---|---|
| **Form1:** V neg<br>e.g. **Afrikaans:**<br>Sy hou **nooit** op met werk.<br>she holds **never** up with work<br>'She never stops working.' | | *! | * | * | |
| ☞**Form 2:** V neg **SN**<br>e.g. **Afrikaans:**<br>Sy hou **nooit** op met werk **nie**.<br>she holds **never** up with work **SN**<br>'She never stops working.' | | | ** | ** | |

Afrikaans differs from other strict NC languages. As long as Afrikaans contains a post-verbal SN, it satisfies the constraints MaxSN and NegFirst so that they are ranked independently in the order MaxSN >> NegFirst. Accordingly, we can conclude that the meaning of a sentence in NC languages is not affected by sentential negation (Swart and Sag, 2002).

Both strict and non-strict NC languages depend on the syntactic constraints MaxSN or NegFirst.

*4.7 Mixed strict and non-strict NC in BiOT*

As we discussed earlier, KJA exhibits a mixed case of NC with strict and non-strict n-words at the same time. In the case of both non-strict and strict postverbal n-words the high ranking of NegFirst makes an output with a preverbal SN the optimal candidate as illustrated in the following Tableaux.

**Tableau (17): Generation of post-verbal non-strict n-words in KJA**

| **Meaning**: ¬V∃x | **MaxNeg** | **NegFirst** | **MaxSN** | ***Neg** | **IntNeg** |
|---|---|---|---|---|---|
| **Form 1:** V neg<br>e.g. KJA:<br>ʤa **wala** wāħad.<br>came.3SM **no** one<br>'No one came.' | | *! | * | * | |
| ☞**Form 2: SN** V neg<br>e.g. KJA:<br>**mā**-ʤa **wala** wāħad.<br>**SN**-came.3SM **no** one<br>'No one came.' | | | | ** | |

**Tableau (18): Generation of post-verbal strict n-words in KJA**

| **Meaning**: ¬V∃x | **MaxNeg** | **NegFirst** | **MaxSN** | ***Neg** | **IntNeg** |
|---|---|---|---|---|---|
| **Form1:** V neg<br>e.g. KJA:<br>Sāra bitħib r-rasim<br>Sara like.3SF the-drawing<br>**bilmarrah**<br>**never**<br>'Sara does not like drawing at all.' | | *! | * | * | |
| ☞**Form 2:** SN V neg<br>e.g. KJA:<br>Sara **mā**-bitħib r-rasim<br>Sara **SN**-like.3SF the-drawing<br>**bilmarrah**<br>**never**<br>'Sara does not like drawing at all.' | | | | ** | |

According to tableau (17) above, the n-word *wala* is non-strict in a post-verbal position. The high ranking of NegFirst makes the form containing an SN optimal (i.e. (form 2) is the optimal candidate). In tableau (18) above, we have the strict n-word *bilmarrah*. (Form 2) is the optimal candidate according to NegFirst.

With preverbal n-words (strict or non-strict), NegFirst is already satisfied by the n-word in preverbal position. We can account for why preverbal non-strict n-words in KJA do not require the presence of an SN whereas preverbal strict n-words in the same language do by stochastic OT. Here, we assume that the constraints *Neg and MaxSN are ranked equally high. We assume that MaxSN and *Neg inherently occur in the same stratum and their order can be changed in relation to each other (i.e. *Neg <<>> MaxSN) according to the type of the n-word used (i.e. strict or non-strict). If the speaker uses a non-strict n-word, she opts for a ranking with the constraint *Neg outranking the constraint MaxSN as illustrated in Tableau (19). If the speaker uses a strict n-word, she opts for a ranking with the constraint MaxSN outranking *Neg as illustrated in Tableau (20).

**Tableau (19): Generation of preverbal non-strict n-words in KJA**

| **Meaning**: ¬V∃x | **MaxNeg** | **NegFirst** | **MaxSN<** | **>*Neg** | **IntNeg** |
|---|---|---|---|---|---|
| ☞**Form 1:** neg V<br>e.g. KJA:<br>**wala** wāħad ʤa.<br>**no** one came.3SM<br>‘No one came.’ | | | * | * | |
| **Form 2:** neg SN V<br>e.g. KJA:<br>**wala** wāħad **mā**-ʤa.<br>**no** one **SN**-came.3SM<br>‘No one came.’ | | | | ** | |

**Tableau (20): Generation of preverbal strict n-words in KJA**

| **Meaning**: ¬V∃x | **MaxNeg** | **NegFirst** | **MaxSN<** | **>*Neg** | **IntNeg** |
|---|---|---|---|---|---|
| **Form 1:** neg V<br>e.g. KJA:<br>**bilmarrah** Sāra bitħib r-rasim.<br>**never** Sāra like.3SF the-drawing<br>‘Sara does not like drawing at all.’ | | | * | * | |
| ☞**Form 2:** neg SN V<br>e.g. KJA:<br>**bilmarrah** Sāra **mā-**bitħib r-rasim.<br>**never** Sara **SN-**like.3SF the-drawing<br>‘Sara does not like drawing at all.’ | | | | ** | |

Tableaux (19) and (20) above show how the structure of a sentence with a preverbal n-word varies depending on the ranking of MaxSN and *Neg under different contexts (i.e. type of n-word) determined by the speaker. In tableau (19), the output forms include a preverbal non-strict n-word, and the speaker will choose a ranking of *Neg outranking MaxSN resulting in a sentence without an SN as the optimal candidate. In tableau (20), the output forms include a preverbal strict n-word, and the speaker will choose a ranking of MaxSN outranking *Neg resulting in a sentence with an SN as the optimal candidate.

## 5. Conclusion

The current study has discussed the phenomenon of NC in KJA. NC is the phenomenon whereby a negative instance fails to contribute negation when it co-occurs with another negative instance. What is interesting in NC is that it poses a serious challenge for a very well-established principle of linguistics which is the Principle of Compositionality (Davidson 1967) which asserts that the meaning of a sentence must reflect the meaning of the individual words that form that sentence. Since we have two negative instances within a sentence, this means that the sentence must have a double negation reading rather than a concordant reading.

Two types of NC have been identified in the previous literature. These include strict NC and non-strict NC. Strict NC languages require that the n-word must co-occur with an SN regardless of whether it occurs in a post-verbal position or a preverbal position. In non-strict NC languages, post-verbal n-words must be accompanied by an SN whereas preverbal n-words must not. KJA exhibits both strict and non-strict NC at the same time. The current study has addressed this mixed case of NC which has been rarely studied in the literature.

The current study addresses NC in KJA within the framework OT. The use of OT in syntax in general and in negation in particular is very rare which adds to the importance of the study. The study mainly attempts to extend de Swart's (2006, 2010) OT analysis of NC to KJA. We have shown that BiOT can explain the mixed case of NC in KJA. We have also shown that StOT, which is another advanced version of OT, can account for ambiguous NC sentences in the language.

**References**:

Alsarayreh, A. (2012). *The Licensing of negative sensitive items in Jordanian Arabic* (Doctoral dissertation). University of Kansas.

Benz, A. & Mattausch, J. (1984). *Bidirectional optimality theory*. Taiwan: Providence University.

Besten, J. (1986). Double negation and the genesis of Africans. In P. Muysken & N. Smith (Ed.), *substrata versus universal in Creole languages* (pp. 185-230). Amsterdam: John Benjamins.

Błaszczak, J. (2001), *Investigation into the Interaction between the Indefinites and Negation*, Berlin, Akademie Verlag.

Boersma, P. (1998). *Functional phonology* (Doctoral dissertation). University of Amsterdam.

Chomsky, N. (1995). *The minimalist program*. Cambridge: MIT Press.

Corblin, F. & Tovena, L. (2003). L'expression de la négation dans les languages romanes. In D. Godard (Ed.), *Les langues romanes: problème de la phrase simple* (pp. 279-342). Paris: CNRS Editions.

Davidson, D. (1967), 'The logical form of action sentences', in N. Rescher (ed.), *The Logic of Decision and Action*, Pittsburgh, University of Pittsburgh Press, 81-95.

de Swart, H. & Sag, I. (2002). Negation and negative concord in Romance.*Linguistics and Philosophy 25*: 373–417.

de Swart, H. (2006). Marking and interpretation of negation: A bidirectional optimality theory approach. In R. Zanuttini, H. Campos, E. Herburger,and P. Portner (Ed.), *Comparative and cross-linguistic research in syntax, semantics and computational linguistics* (pp. 199-218).Washington: Georgetown University Press.

de Swart, H. (2010). *Expression and interpretation of negation: An OT typology*. Dordrecht: Springer.

Giannakidou, A. (1998). *Polarity sensitivity as (non)veridical dependency*. Amsterdam and Philadelphia: John Benjamins.

Giannakidou, A. (2000). Negative ... concord?. *Natural Language and Linguistic Theory 18*: 457–523.

Haspelmath, M. (1997). *Indefinite pronouns*. Oxford: Oxford University Press.

Jesperson, O. (1933). *Essentials of English grammar*. Tuscaloosa: University of Alabama Press.

Kager, R. (1999). *Optimality theory*. Cambridge: Cambridge University Press.

Laka, I. (1990). *Negation in syntax: On the nature of functional categories and projections* (Doctoral dissertation). MIT.

McCarthy, J. (2001). *A thematic guide to optimality theory*. Cambridge: Cambridg University Press.

Penka, D. (2011). *Negative indefinites*. Oxford, Oxford University Press.

Wouden, A. van der. (1997). *Negative contexts: Collocation, polarity and multiple negation*.London: Routledge.

Wouden, A. van der., & F. Zwarts. (1993). A semantic analysis of negative concord. In U. Lahiri and A. Z. Wyner (Eds.), *Proceedings of SALT3* (pp. 202-19). Ithaca, NY: CLC publications, Cornell University.

Zanuttini, R. (1991). *Syntactic properties of sentential negation: A comparative study of Romance languages* (Doctoral dissertation). University of Pennsylvania.

Zeijlstra, H. (2004). *Sentential negation and negative Concord* (Doctoral dissertation). University of Amsterdam.