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RESEARCH

Micro-syntactic variation in American English Negative Concord

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This paper presents a series of quantitative gradient acceptability judgment studies of English negative sentences. Adult native speakers of American English recruited via Amazon's Mechanical Turk were asked to rate sentences on a scale of 1 to 7 on the basis of their naturalness. The main study compares sentences with the marker *n't* and either a negative object (e.g. 'John didn't eat nothing') or a negative subject in canonical position ('nobody didn't eat'). Each sentence type has two possible interpretations, one in which the two negatives contribute a single semantic negation, the so-called Negative Concord reading, and another in which the two negations yield a semantic Double Negation logically equivalent to an affirmative. While mean acceptability ratings were below the median for all items, statistical analyses of the gradient data revealed that speakers prefer Negative Concord over Double Negation readings for sentences with negative objects. To rule out a processing explanation for the preference for negative objects over sentence initial negatives, a follow-up study tested the acceptability of sentences with a single negative subject or object and no negative marker. This revealed a preference for subjects, suggesting that the object preference in the two negatives study is a true grammatical effect. A third study revealed that Double Negation constructions are unacceptable overall even in explicit denial contexts, and a fourth study added Negative Auxiliary Inversion constructions (e.g. 'Didn't nobody eat'), to compare three types of Negative Concord. The results of all four studies are argued to reveal an English grammar that generates both Negative Concord and Double Negation, and in which Negative Concord is generated despite its unacceptability and reported absence in usage.

Keywords: Negative Concord; Double Negation; gradient acceptability; micro-syntactic variation; experimental syntax

1 Introduction

Most adult English speakers have heard sentences like (1) used with the meaning in (2):

(1) John didn't eat no breakfast.
(2) John ate no breakfast.

Sentence (1) has two negations, but the meaning in (2) has only one. English is among the many natural languages in which sentences with two or more syntactic negations can have a single negative meaning, a phenomenon called Negative Concord (NC).[1] Unlike in other languages, however, English NC has the distinctive property of being heavily socially stigmatized. This study investigates how the tool of gradient acceptability can

[1] See, for example, Herburger (2001) on Spanish, Giannakidou (2000) on Greek, Haegeman and Zanuttini (1996) on West Flemish, Biberauer and Zeijlstra (2012) on Afrikaans, Puskás (2012) on Hungarian, De Swart and Sag (2002) on French, and Zanuttini (1997) on Italian, to name a few. See Zeijlstra (2004) for an extensive overview.

be used to determine whether adult native speakers of American English who find NC unacceptable nevertheless display grammatical knowledge of it.

I present the results of a series of four quantitative gradient acceptability judgment studies of English negative sentences. The first study focuses on a set of sentences with the marker *n't* and a negative noun phrase (as in (1)), in which both the position of the negative phrase and the sentence's meaning are systematically varied: The noun phrase may appear in either subject or object position, while the sentence meaning may be either NC or Double Negation (DN). In DN sentences, each negation contributes to the semantics. Thus sentence (1) under a DN interpretation means that it is not the case that John did not eat breakfast, logically equivalent to the affirmative statement that John ate breakfast. The study results reveal a strong preference for sentences with a negative object, and a significant interaction in which speakers prefer NC contexts for sentences with a negative object but not for those with a negative subject in canonical position.[2]

The second and third studies are designed to inform the results of the first. The second study asks whether the preference for negative objects is retained when the marker *n't* is removed, to determine whether the object preference revealed in the first two negatives study is a true syntactic effect related to NC or simply a dis-preference for sentence-initial negatives. The third study focuses on DN, and tests whether the addition of an explicit negation in the context sentence improves overall DN acceptability. The fourth study focuses on NC alone, comparing three syntactic types: sentences with *n't* and a negative object, those with *n't* and a negative subject in canonical position, and those in which a negated auxiliary appears immediately preceding a negative subject. The combined results of the four studies reveal an English NC grammar that is sensitive to the position of the marker *n't* relative to the negative phrase, whereby the phrase must appear in the scope of the negative marker. I argue that these results support theories that predict NC and DN to coexist in a single grammar.

The quantitative studies of adult acceptability judgments of English NC this paper presents are the first of their kind. Because of the heavy social stigma associated with English NC, casual observations show that even speakers who use NC constructions regularly judge them unacceptable. One might therefore conclude that acceptability judgments of NC should have no bearing on grammatical theories, as their acceptability reflects only their sociolinguistic and not their grammatical status (Barbiers 2005; 2009). The data this study contributes illustrate the utility of gradient acceptability when investigating the grammatical properties of socially stigmatized construction types. They further illustrate that speakers make fine-grained distinctions between distinct NC sentence types that are systematically varied with respect to the position of a negative phrase relative to the marker *n't*, despite the fact that they find these sentence types unacceptable overall. Speakers who do not accept NC are thus shown to nevertheless have grammatical knowledge of it.

This paper is structured as follows. Section 2 provides background on English Negative Concord. Section 3 describes the two negatives study, followed by the single negatives study in Section 4 and the study of explicitly marked DN in Section 5. Section 6 reports and discusses the results of the study examining three types of NC. Section 7 synthesizes and situates the results of the four studies in the context of previous empirical findings, and discusses how they inform NC theories, and Section 8 concludes.

[2] The results of Study IV, which I report in Section 6, show that reference to canonical subject position is necessary, and that the important distinction is not subject vs. object, but rather the position of the negative phrase relative to the marker *n't*.

2 Background

This section provides background on English NC, with the aim of motivating and contextualizing the quantitative studies presented in sections 3 through 6. Section 2.1 reviews research on how NC came to be socially stigmatized in English. In Section 2.2 I discuss research demonstrating that children acquiring English whose caregivers do not use NC nevertheless both use and comprehend it. Section 2.3 illustrates contemporary patterns of micro-syntactic variation in English NC. Lastly, Section 2.4 synthesizes the research reviewed in this section to show how it motivates and underlies the design of the gradient acceptability studies presented in this paper.

2.1 The social stigmatization of English NC

Though historically ubiquitous in written texts, diachronic corpus studies show that NC gradually disappeared from texts by formally educated writers during the transition from Middle English (c. 1350–1650) to Early Modern English (c. 1650–1800) (Nevalainen 1998, 1999, 2006; Kallel 2007). The following are examples of NC in Old and Middle English respectively (taken from Wallage 2012: 10):[3]

(3) *Old English* (thirteenth century; ANCRIW, II.97.1168)
He ne cnaweð nan mon.
he neg knows no man
'He knows no man.'

(4) *Middle English* (sixteenth century; TORKINGT-E1-H, 58.328)
We might not make no sale in Christmasse week.
we might not make no sale in Christmas week
'We might not make a/any sale during Christmas week.'

These examples are parallel to contemporary NC sentences like (1) in that a preverbal marker and a negative phrase in object position together mark a single negation.

Nevalainen (1998, 1999, 2006) illustrates a sixteenth century shift in texts by formally educated writers from NC to Negative Polarity Item (NPI) constructions. The following sixteenth century NPI example is from Smith (2001: 112; her example (4)):

(5) Thomas More (1534)
…howbeit, he is not worthy to have any good wyne…

Example (5) contains the marker *not* and the NPI object *any good wyne*, which could equivalently be stated as *no good wine* to yield a well formed NC sentence.

Nevalainen (2006) demonstrates that the writers leading the shift from NC to NPI constructions were typically male, and belonged to the upper class. She notes that the virtual disappearance in upper class writing occurred before the social stigmatization of NC, and argues that the shift from NC to NPIs was socially motivated, used as a marker of higher social status. This was followed by the explicit prohibition of NC by prescriptive grammarians. In his *Short Introduction to English Grammar*, Bishop Lowth (1762) ruled that in English, two negatives should equal a positive (Horn 2010). That the shift has clear social motivations suggests that it was not a grammar-driven change. The proscription

[3] Wallage (2012) uses the York Corpus of Old English Prose (Taylor et al. 2003), the Penn-Helsinki Parsed Corpus of Middle English (2nd edition) (Kroch & Taylor 2000), the Penn-Helsinki Parsed Corpus of Early Modern English (Kroch, Santorini & Delfs 2004), and the Parsed Corpus of Early English Correspondence (Taylor et al. 2006).

against NC continues to pervade English speaking society, and is transmitted in home and academic settings as well as in the media.[4]

In the next section, I summarize previous quantitative and experimental studies of NC in child English. Like the diachronic corpus studies discussed in this subsection, results from child language studies suggest that the shift away from NC in usage and its subsequent explicit prohibition may reflect only a surface level change, and that some properties of NC grammar may have been retained underlyingly.

2.2 NC in contemporary child English

Several corpus and psycholinguistic studies have examined NC production and comprehension in child English. Because children have had less exposure than adults to normative pressure, child language arguably provides a more straightforward source than adult language from which to draw inferences about the grammatical status of contemporary English NC. This section thus summarizes insights into English NC gained through careful examination of child language.

2.2.1 Child NC in spontaneous speech

Corpus studies of child language have demonstrated a mismatch between children's and adult's English NC production: some children use NC even when it is not present in the input. (But see Henry 2016, discussed in fn. 5 below.) Miller (2012) examines the production of one child, Sarah, as instantiated in the Brown (1973) corpus in the CHILDES database (MacWhinney 2000). Miller characterizes tokens of both NC and NPI constructions as possible NC contexts, and finds that throughout the recordings (done between the ages of three and five), Sarah produces NC in 65% of these contexts. However, her parents produce NC less than 9% of the time. The data thus demonstrate a clear case of asymmetry between adult and child language with respect to NC, whereby the child uses it much more frequently than her parents. Miller suggests that the formality of the task, in which a researcher was present in the home to conduct the recordings, may have prompted parents to consciously avoid NC due to its social stigma, and it is possible that they use it more frequently in less formal settings. If this is the case, then this study demonstrates that children are less attuned to social norms than adults with respect to NC usage. The results further suggest that when social norms are not a factor, NC comes naturally.

Another corpus study in Thornton and Tesan (2013: 397–400) compares both Sarah and Adam's NC and NPI usage in the Brown (1973) corpus on CHILDES (MacWhinney 2000) with data from children acquiring Belfast English (Henry 1995; Wilson and Henry 1998; also available on CHILDES). The difference between Sarah and Adam on the one hand, and the children acquiring Belfast English on the other, is that the latter are in an environment where NC usage is clearly an option, while this is not clear for Adam and Sarah.[5] The authors find that despite this difference, all the children begin using NC at the same age (around 3:5). This study thus demonstrates that apparent differences in the input do not seem to impact young children's NC usage trajectory in the early stages, and they further

[4] See, for example, the following entry on "The Snarky Student's Guide to Grammar": http://snarkygrammarguide.blogspot.com/2012/10/double-negative-cant-hardly-barely.html.

[5] The corpus study in Henry (2016) examines variation in the production of eight children acquiring Belfast English. She finds that children's NC usage patterns closely with that of their caregivers, which is itself highly variable. Henry demonstrates that in addition to NC, caregivers use sentence types with a single negative (e.g. 'I ate nothing') as well as those with a Negative Polarity Item (e.g. 'I didn't eat anything'). She further demonstrates that of these three sentence types, NC occurs with the lowest frequency. Children's usage reflects these patterns, with NC occurring the latest and with the lowest frequency in their spontaneous speech as compared with these other two construction types. In Section 2.3 I discuss how some adult American Englishes display similar patterns of variation.

confirm Miller's (2012) finding that children acquiring an apparently non-NC version of English nevertheless use NC quite naturally. Thornton and Tesan (2013: 399) propose that for children acquiring English in environments in which NC is not used, "it is quite likely that [NC] does not dissipate until it is stamped out by prescriptive grammar in the school years". If this is the case, then it remains an open question whether the prescriptive forces that suppress NC usage also induce a grammatical change.

2.2.2 Experimental work with children

Like the corpus studies discussed above, experimental work demonstrates similar behaviors across groups of children acquiring English in contexts where it is in the adult input and those where it is not. Coles-White (2004) tested two groups of children aged five to seven. One group spoke "African American English" (AAE), and the other spoke "Standard American English" (SAE). (See also Coles-White et al. 2004.) She asked whether and how children interpreted sentences like the following, using illustrated contexts:

(6) The man didn't feed the baby with no spoon. (NC)

(7) The man didn't feed the baby with no hair. (DN)

The salient reading of (6) is NC, in which it is not the case that the man used a spoon to feed the baby (though he may have used a bottle). Sentence (7) is only felicitous with a DN interpretation, under which it is not the case that the man fed the baby that has no hair. Interestingly, the study found no significant differences across the two groups in their ability to correctly interpret the NC constructions: both AAE and SAE speaking children performed equally well on the NC condition, with correct answers given between 77% and 87% of the time. Coles-White also found that for both groups, the DN constructions were significantly harder to interpret, with some correct response rates as low as 54%.

The experimental results reported in Thornton et al. (2016) further contribute to our understanding of the status of NC in child English. They conducted a truth value judgment task (Crain & Thornton 1998) with 3–5 year old children as well as adult speakers of Australian English, in which they report NC to be socially stigmatized. Their protocol involved contexts that elicited either the NC or the DN interpretation of pragmatically ambiguous sentences in which the marker *n't* and a negative object appear in the same clause, as well as DN-only sentences in which the marker is embedded in a subject relative clause, and is too far syntactically from the negative phrase to enter into concord. The following examples illustrate their items, with the contexts simplified for rhetorical purposes:

(8) NC Context: A mouse dresses up, then decides not to cook.
NC Item: The mouse who dressed up didn't cook nothing.

(9) DN Context: A girl skips then goes to the store and buys flowers.
DN Item: The girl who skipped didn't buy nothing.

(10) DN-only Item: The mouse who didn't dress up cooked nothing.

The authors find that in the pragmatically ambiguous condition, children perform significantly better with the NC items than the DN items in assigning the truth value elicited by the context. This distinguishes their behavior from the adults, who perform significantly better with DN than with NC. Additionally, they find that the children and adults perform equally well on the DN-only condition, in which deriving the correct interpretation does not rely on context.

Thornton et al. (2016) argue that their results support the hypothesis that the children have NC grammars, while the adults have DN grammars. However, given that their protocol was designed for children and acted out with puppets, but was conducted with the adults in written form only and in a university setting, it remains unclear whether the adult results represent a prescriptive judgment of the test sentences or a genuine difference in their comprehension of NC vs. DN. The studies reported in Sections 3 through 6 of this paper shed light on this open question. For present purposes it suffices to note that the study by Thornton and colleagues contributes additional experimental evidence demonstrating that young children who do not appear to have NC in their regular input nevertheless interpret it readily and correctly.

Taken together, the experimental and corpus studies described in this section demonstrate that children acquiring English begin using and comprehending NC at an early age, and that this seems to be true regardless of whether NC is present in the input. NC thus appears to come naturally for children acquiring English, but the question remains as to what happens when NC usage is "stamped out", to borrow Thornton and Tesan's (2013) phrasing. A related question is explored in Meisel et al. (2011), who examine the acquisition of structures that appear in formal but not colloquial French, and hence do not appear in some children's input in their earliest years of acquisition. They conclude that such instances of "delayed acquisition" yield highly variable adult grammars in which the structures in question appear to be only partially represented.

Regarding NC, the question remains as to whether the normative pressures influencing its usage change the developing child's grammar, or whether they effect mere surface changes while NC knowledge remains intact. The series of gradient acceptability studies reported in this paper represent a step toward answering this question through controlled examination of NC acceptability in native English-speaking adults. I now discuss contemporary syntactic patterns in English NC, with the aims of illustrating the motivation for the study designs, and providing additional empirical and typological background for the subsequent theoretical discussion.

2.3 Microvariation in adult English negative sentences

Wolfram and Fasold (1974) observe that NC is so widespread in contemporary American English that it is used in all varieties except the standardized one. Varieties of American English that display NC include Appalachian (Wolfram and Christian 1976), African American English (Green 2002), Alabama English (Feagin 1979), New York English (Labov et al. 1968), West Texas English (Foreman 1999), and many more. Why should NC be present in all these varieties of English but not in the standardized one? This variety is widely considered the prestige variety, and it is heavily shaped by prescriptive norms. I propose that the prestige status of standardized English supports the hypothesis that the absence of NC is merely a surface effect, and that while NC may be unacceptable and unrealized in standardized English (in the sense of Barbiers 2005, 2009), it continues to be grammatical.

With several notable exceptions, English NC has often been ignored in the theoretical literature, and (Standard) English is frequently referred to as a "DN language" (Puskás 2012; Déprez et al. 2015; Espinal and Tubau 2016; a.o.). Nevertheless, like NC patterns found in other languages, English NC displays microvariation both diachronically and synchronically (Iyeiri 2005). The corpus analysis in Smith (2001) demonstrates that English NC constructions with the marker *n't* and a negative object, (e.g. (1), henceforth Object NC), are more common than those with a negative subject plus *n't* (henceforth Subject NC). Thus, NC examples like the following appear less frequently and in fewer geographic and cultural regions than Object NC:

(11) Nobody didn't eat breakfast.
'Nobody ate breakfast.'

Smith (2001: 123) shows that while both Object NC and Subject NC occur in Appalachia, a cultural region in the Eastern United States, only Object NC appears in Inwood, New York. Anderwald (2002, 2005) reports similar usage patterns in British English dialects, which suggests that this is an English-general phenomenon. Tortora (2007) characterizes this pattern in terms of a uni-directional entailment whereby if an English has Subject NC then it has Object NC, but not vice versa.[6]

The preference for Object NC in usage data is coupled with an intriguing interpretation pattern. For many English speakers, the default or out of the blue interpretation for a sentence like (11) is not NC but rather DN: the sentence most naturally means not that nobody ate breakfast, but rather that everybody ate. This is not the case for constructions like (1) with a negative marker and object, which though unacceptable in certain social environments, are most naturally interpreted by some speakers (including me) as singularly negative NC constructions. Thus, for some speakers at least, these interpretation patterns for Object and Subject NC mirror those found in usage: Object NC is both more common and more natural to interpret than Subject NC.

I propose that the usage and interpretation patterns described above suggest the existence of two distinct English NC Grammars: those that do and those that do not have Subject NC. I henceforth call these hypothesized grammars Subject NC and Object NC respectively. This grammatical distinction between Subject and Object English NC Grammars may be instantiated, for example, by some speakers of Appalachian English (Subject NC) on the one hand, and by some speakers of Inwood English (Object NC) on the other. Recall now Tortora's (2007) generalization that languages with Subject NC must also have Object NC (but not vice versa), which captures the facts observed in Smith (2001). Under this generalization, Object NC Grammars are a proper subset of Subject NC Grammars.

2.3.1 Strict vs. Non-Strict NC languages

The above-described distinction between Object and Subject NC Grammars bears a strong resemblance to the well-known distinction between Strict and Non-Strict NC languages (Giannakidou 1997, 1998, 2000). In both Strict and Non-Strict NC languages, negative object DPs must be preceded by a syntactic negation. In Non-Strict NC languages like Spanish, the negative object DP may co-occur with a preceding negative marker (Den Besten's 1986 "Negative Doubling"), as in (12), or it may be preceded by another negative phrase ("Negative Spread"), as in (13). Non-Strict NC languages also allow negative phrases to appear in pre-verbal position with no accompanying clause-bound negation, as in (14):

(12) *Spanish*
*(No) vino nadie.
NEG came nobody
'Nobody came.'

(13) *Spanish*
*(Nunca) vino nadie.
never came nobody
'Nobody ever came.'

[6] Tortora (2007) also includes Negative Auxiliary Inversion in this entailment pattern. For rhetorical purposes I defer discussion of this until Section 3.2.1.

(14) *Spanish*
Nadie vino.
'Nobody came.'

In Strict NC languages, however, while the marker is obligatory in sentences like (12), the types in (13) and (14) are not possible. In these languages, negative phrases must always be accompanied by a negative marker, regardless of their syntactic position. The following examples are from Strict NC languages Greek (Giannakidou 2000: 461) and Romanian (adapted from Longobardi 2014: 231):

(15) *Greek*
Kanenas *(dhen) ipe tipota.
nobody NEG said nothing
'Nobody said anything.'

(16) *Romanian*
Nimeni *(nu) a venit.
'Nobody came.'

In example (15), the object negative phrase *tipota* 'nothing' cannot be preceded only by *kanenas* 'nobody', and the negative marker *dhen* is required (cf. Spanish (10)). Romanian example (16) shows that even negative subjects in Strict NC languages must be accompanied by a clause-bound negative marker (cf. Spanish (11)).

There is a growing body of research demonstrating that Englishes in which NC is used do not appear to fit neatly into the established typology of Strict vs. Non-Strict NC languages. Tubau (2016) demonstrates this for British English dialects, as does Henry (2016) for Belfast English. The following examples from *The Audio-Aligned and Parsed Corpus of Appalachian English* (AAPCAppE; Tortora et al. to appear) show that the picture is similarly complicated in American Englishes:[7]

(17) (AAPCAppE-SKCTC-DN)
Didn't do nothing when you were growing up but make tea.
'You didn't do anything when you were growing up except make tea.'

(18) (AAPCAppE-AOHPASU-TP)
I paid no money, for I didn't have it.
'I paid no money, because I didn't have money.'

(19) (AAPCAppE-SKCTC-LP)
It's some question that should never leave nobody's mind.
'It's a question that should never leave anybody's mind.'

(20) (AAPCAppE-SKCTC-FM)
Nobody didn't touch that but her.
'Nobody touched that except her.'

Example (18) contains a negative object with no preceding negation, a pattern which is impossible in both Strict and Non-Strict NC languages.[8] Example (19) appears to pattern with Non-Strict NC in that a negative object and a preceding negative adverb enter into concord with no marker present, but (20) follows the Strict NC pattern in allowing

[7] The AAPCAppE consists of recordings from five oral history projects. I include with each token the name of the corpus, the sub-collection initials (e.g. SKCTC) and the speaker initials (e.g. DN).
[8] See Green (2011) for a similar description of African American English.

a negative phrase in canonical subject position to enter into concord with the negative marker that follows it. Appalachian and other American Englishes (see fn. 8) therefore display some properties of both Strict and Non-Strict NC, as well as properties possessed by neither NC type. In this way, American Englishes cannot be classified straightforwardly within existing NC typologies, and suggest the need for their further refinement.

The new data presented in this paper contribute further information regarding the typology of English NC as it relates to other languages classified within the Non-Strict and Strict NC categories. I return to this in Section 7, where I summarize and discuss the experimental results.

2.4 Negative Auxiliary Inversion as a special NC type

American English has an additional sentence type in which NC is realized in a manner distinct from both Strict and Non-Strict NC languages, known as Negative Auxiliary Inversion (NAI; Sells et al. 1996; Foreman 1999; Green 2002; Zanuttini & Bernstein 2014; a.o.). NAI constructions are characterized by a negated auxiliary in pre-subject position, in a manner that is string-identical to a yes/no question but with a declarative interpretation. In NAI, the subject may be negative (21), but it does not have to be (22), thus these are not strictly an NC type but rather a construction type that may be NC:[9]

(21) (AAPCAppE: DOHP-ASU-WC)
Didn't nobody live in there then.
'Nobody lived in there then.'

(22) Didn't everybody live in there then.
'Not everybody lived in there then.'

In Smith's (2001) corpus analysis, NAI usage patterns are shown to be identical to Subject NC, used in a proper subset of the geographical regions in which Object NC is used. However, NAI constructions with a negative subject as in (21) are distinct from strings that can give rise to Subject NC in that they have no alternative DN interpretation. While the string 'nobody didn't live there' has both an NC and a DN reading, the string in (21), when interpreted as a declarative, has only the NC reading, and it cannot mean that it is not the case that nobody lived there.

Recall that the hypothesized distinction between Subject and Object NC Grammars was drawn on the basis of differences in both usage and interpretation, such that for some speakers, subjects appearing in canonical position preceding a negative marker naturally give rise to a DN interpretation, as distinct from constructions with negative objects. Given that they cannot pattern with canonical subject constructions in this regard, it is unclear where NAI constructions should fall within the typology. The series of acceptability studies reported in this paper, and the Three Types of NC study reported in Section 6 in particular, directly inform this question.

2.5 Synthesis: Study objectives

In this section I discussed how diachronic changes in the social status of English NC led to a shift away from NC in usage, and towards the use of NPI constructions. This shift was ultimately followed by the explicit prohibition of NC, and this prohibition continues to exert influence over contemporary usage patterns. I also discussed how studies of contemporary child NC usage and interpretation patterns show that young children acquiring English who receive little or no NC input from their caregivers nevertheless

[9] Compare with Foreman's (1999: 8, 11) examples (15a) and (29b).

both use and comprehend it in a manner identical to children regularly exposed to NC. I further noted that NC is found in all American English varieties except the standardized one, a fact that supports the hypothesis that its absence is shaped by extra-grammatical forces.

Taken together, these observations have led me to hypothesize that the diachronic shift away from English NC reflects a mere surface change, with little or no change to the underlying grammar. Under this hypothesis, there is no difference between child and adult grammars with respect to NC, and the differences in usage are merely a result of the adult's learned suppression of this construction type. This hypothesis directly contrasts with that of Thornton et al. (2016), under which adults and children have different grammars with respect to NC. One way of testing this hypothesis is to ask what adult speakers of contemporary American English know about NC, and whether there exists an asymmetry between their acceptability of NC in general and their ability to distinguish between different English NC types. Section 2.3 described how contemporary English sentences with two negatives display syntactic variation in both usage and interpretation. These patterns are exploited in the quantitative study designs that aim to test adult speaker knowledge of both NC and DN, which I turn to now.

3 Study 1: Two negatives

3.1 Methodology

The two negatives study reported in this section aims to test (i) whether adult speakers of American English distinguish between Object NC and Subject NC, and (ii) whether the syntactic position of a negative noun phrase in a sentence with two negatives interacts with its interpretation as either NC or DN. Normative pressures shape the acceptability of English NC, and casual observations show that even speakers who use it judge it unacceptable. However, as discussed in Section 2, taken together the diachronic and synchronic facts, as well as observations of child language, suggest that adult speakers who do not accept or use NC may nevertheless have grammatical (or syntactic) knowledge of it. Previous work shows that gradient acceptability judgments gathered on a Likert scale of 1 to 7 can reveal differences between systematically varied sentence types that are unacceptable overall (Staum & Sag 2008; Staum et al. 2010). This study thus employs the tool of gradient acceptability to determine whether speakers who find NC unacceptable nevertheless detect syntactic differences between NC sentence types, specifically by exploiting canonical subject-object asymmetries in usage and interpretation.

3.1.1 Groups and items

Following Keller (2000), participants were separated into two groups, a No-context and a Context Group, and each group took a different survey. Both surveys included a total of 16 items and 32 fillers, a portion of which also served as control items. Participants were asked to judge sentences on the basis of their naturalness on a Likert scale of 1 to 7. Two practice items were included and followed by feedback to ensure participants understood how to use the scale.

Each test item contained the marker *n't* and a negative noun phrase. In half of the 16 test items the negative noun phrase was in object position, and in the other half it was in subject position. The following examples illustrate the negative object and negative subject items respectively:

(23) He didn't take nobody on the trip.

(24) Nobody didn't help patients on that day.

If speakers have syntactic knowledge of NC, then they may prefer object items like (23) to subject items like (24), in line with the usage patterns observed in Smith (2001). Conversely, speakers with no syntactic knowledge of NC will be expected to find all test items unacceptable overall, with no difference across syntactic type.

Given that sentences with two negatives have two logically possible interpretations (NC and DN), due to the lack of context, even if speakers demonstrate a preference for a particular syntactic type, it will remain unclear as to what interpretation they are assigning the item. To solve this problem, a similar protocol with contexts was also administered. The No-context Group was presented each item individually and asked to rate it absent of any context, as in (23) and (24). A second Context Group was provided with a single test sentence prior to each item, designed to elicit either an NC or a DN interpretation. To control for the possibility that specific items were biased towards an NC or a DN interpretation, this group was further divided into two subgroups. If an item was presented in an NC context to one subgroup, then it was presented in a DN context to the other. Both groups judged the same 16 items, but for the Context Group they were presented as follows (minus the illustrative labels):

(25) a. NC Context: John went on vacation all alone.
Negative Object: He didn't take nobody on the trip.

b. DN Context: Mary said John went on vacation all alone, but Mary's wrong.
Negative Object: He didn't take nobody on the trip.

(26) a. NC Context: The hospital was closed because of the storm.
Negative Subject: Nobody didn't help patients on that day.

b. DN Context: All the doctors treated patients at the hospital.
Negative Subject: Nobody didn't help patients on that day.

Each participant in the Context Group received either (25a) or (25b), (26a) or (26b), and so on. Note that none of the context sentences include explicit negation. This was a necessary control, given that the use of a single negation in the context sentence, which would have been particularly useful for the DN items, may have biased speakers toward a particular use or interpretation of the two negatives test items and hence confounded the study results. I address this issue directly in Section 5, where I report a study that examines DN constructions only in contexts with explicit negation. For the present purpose it suffices to note that DN contexts that elicited a denial interpretation (e.g. (25b)) were designed to do so by providing an implicit negation, in order to control for any stylistic biases or other potential confounds that could be introduced through the provision of a single negation prior to the test sentence. This control was necessary in order to be able to effectively compare individual speaker's assessments of both NC and DN constructions.

The items in the Context Group protocol were split equally between NC and DN contexts, and each participant judged eight NC and eight DN items of each syntactic type (4 object and 4 subject). If participants in the Context Group demonstrate a preference for one syntactic type, then these data can help determine whether and how this preference is shaped by interpretation (as either NC or DN), and also whether the interpretation patterns discussed in Section 2.3, in which Object NC is more natural than Subject NC, can be replicated in acceptability judgments.

3.1.2 Fillers and controls

Both the No-context and the Context Groups judged the same thirty-two fillers, which were systematically varied in acceptability and grammatical complexity. Fully acceptable

filler items with structural complexity comparable to negation, including conditionals and sentences with embedded relative clauses, were used as controls for comparison with the test items. The following is an example of a filler that served as a control item as presented to the Context Group:

(27) There was at least one adult watching all of the kids on the playground.
The tall woman watched the boy who was wearing the red hat while he played.

Both groups were instructed to judge the second sentence, but the No-context Group saw only the second sentence and was asked to judge its naturalness independently of any context.

3.1.3 Participants

161 adult native speakers of American English were recruited via Amazon's Mechanical Turk (Gibson et al. 2011; Sprouse 2011) to participate in online surveys. AMT provided participants with a link to a survey on SurveyGizmo.com, which includes features such as question randomization and logic for eliminating unqualified participants.[10] The survey began by asking participants whether they (i) were native English speakers, (ii) had grown up in the United States, and (iii) were over 18 years of age. A *no* response to any of these questions resulted in immediate disqualification.

A demographic survey was administered post-hoc to collect further information on participants' backgrounds. The results are summarized in Tables 1–3.

As shown in the tables the results of the demographic survey revealed that participants represented a geographically diverse group of native American English speaking adults, and that the largest participant subgroups were college-educated and from suburban areas.

Because of the heavy social stigma associated with English NC, self-reporting of NC usage is not a valid measure. This is because speakers who use NC often do not admit to it, and may even be unaware that they use it. Nevertheless, the following questions were used post-hoc to determine whether participants would report to being NC users:

Table 1: Participants' levels of formal schooling (N = 161).

	High School	College	Graduate Studies
Proportion	.373	.503	.124

Table 2: Participants' upbringing environment types (N = 161).

	Urban	Suburban	Rural
Proportion	.217	.559	.224

Table 3: Participants' regions of origin (N = 161).

	Northeast	Southeast	Midwest	South	Northwest	Southwest
Proportion	.261	.174	.248	.130	.068	.118

[10] To ensure each participant completed only one survey, once they were finished they were provided with a unique verification code (Burleigh 2016). When redirected to the Mechanical Turk interface, participants entered their unique code and received their payment.

3.1.3.1 Post hoc usage question 1: Object NC

Imagine a situation in which you have finished dinner, and you want to tell someone that dessert was not a part of your meal. Which of the following would you be more likely to say?

(a) I didn't have no dessert.
(b) I didn't have any dessert.
(c) Either (a) or (b).

3.1.3.2 Post hoc usage question 2: Subject NC

Imagine a situation in which you threw a party, but all the people you invited decided to do something else instead of attending your party. In that situation, would it be natural for you to say "Nobody didn't come to my party"?

(a) Yes
(b) No

Post hoc question 1 was designed to determine whether participants would report to using Object NC. Both (a) and (c) responses indicate that they do, whereas a (b) response, which contains a prescriptively acceptable Negative Polarity Item construction as an alternative to NC, indicates that they do not. For this question, of the 161 participants who participated in the study, two answered (b), one answered (c), and the remainder answered (a) indicating that they do not use Object NC. Post hoc question 2 was designed to elicit information about participants' reported use of Subject NC. Assuming they understood the question, an (a) response indicates that they do report to using Subject NC, while a (b) response indicates that they do not. For this question, five of 161 participants gave an (a) response, and the remainder answered (b). Only one of the participants who reported to using Subject NC also reported to using Object NC.

There are several possible ways to interpret these post hoc question responses. One is to assume that participants accurately reported their NC usage in response to both questions. This would mean that the group consisted of 154 non-NC users, two Object NC-only users, four Subject NC-only users, and one user of both Object and Subject NC. Another possible interpretation is that, because the Subject NC question is more difficult to understand (given that there is no NPI alternative to offer), while all or most answered the Object NC question accurately, some were confused by the Subject NC question, hence those results are not valid. Under this interpretation, the group consisted of 158 non-Object NC users, but no conclusions can be drawn about Subject NC usage. A final possible interpretation is that many participants were either unaware of their NC use, or preferred not to acknowledge it due to its social stigma. Under this interpretation, the results of both post hoc questions are invalid. It is likely that the correct interpretation is some combination of these three possibilities. As such, the only clear conclusion that can be drawn from these results is that the majority of participants reported to being non-NC users.

3.2 Results

3.2.1 The No-context Group

Of the 60 participants tested in the No-context Group, one had a mean score below the median of 4 in the control condition, and was thus excluded from the analysis. Figure 1 illustrates the results.

As shown in Figure 1, the acceptable control items (M = 6.2, $S.D.$ = .60) were significantly more acceptable than the two negatives test items, and both objects

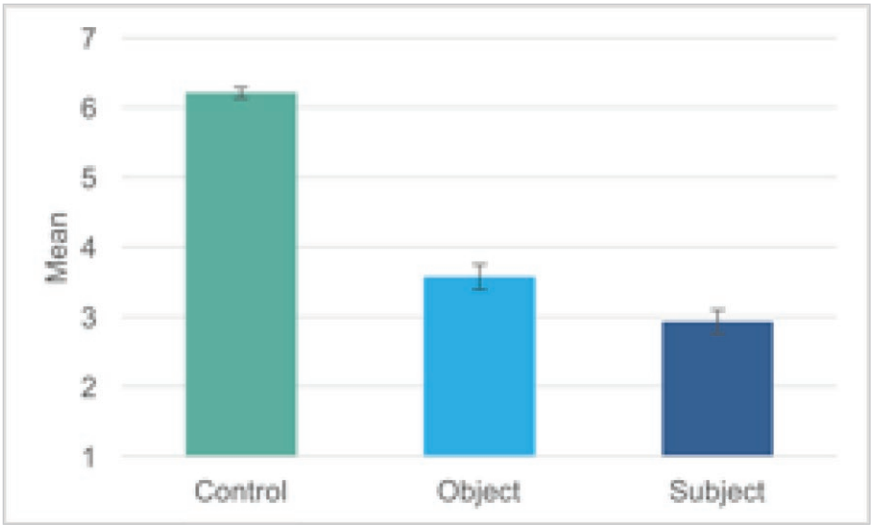

Figure 1: No-context Group mean (S.E.) acceptability ratings (n = 59).

($M = 3.57$, $S.D. = 1.37$) and subjects ($M = 2.93$, $S.D. = 1.33$) were unacceptable overall, with means below the median of 4.[11] A one-way repeated measures ANOVA revealed a significant effect of condition (control vs. object vs. subject) on item acceptability ($F(2, 58) = 221.39$, $p < .001$). Post hoc paired *t*-tests were performed to determine the nature of this effect. These revealed that controls were significantly more acceptable than both object items ($t(58) = 15.22$, $p < .001$) and subject items ($t(58) = 18.17$, $p < .001$). They further revealed a significant difference between the critical item types such that negative objects were significantly more acceptable than pre-verbal negative subjects ($t(58) = 4.61$, $p < .001$).

Note that the results of the comparison between negative objects and negative subjects corroborate Smith's (2001) corpus study, in which negative objects were found to be more common than preverbal negative subjects. This suggests that speakers who find NC unacceptable may nevertheless have some knowledge of its micro-syntactic distribution. However, because both a DN and an NC interpretation are logically possible for the test items, it is unclear on the basis of these results whether participants were interpreting the test items as NC. I now turn to the Context Group results, which serve to clarify this issue.

3.2.2 The Context Group

Of the 101 participants tested in the Context Group, two had means below the median of 4 in the control condition, hence were excluded from the analysis. Figure 2 illustrates the mean acceptability ratings for the Context Group.

Figure 2 shows that like the No-context Group, participants in the Context Group found the test items to be unacceptable overall, with mean acceptability ratings well below the median, as distinct from the acceptable controls ($M = 6.06$, $S.D. = .72$). A two-way ANOVA was conducted to compare the effects of syntactic position and context type on acceptability. This revealed a main effect of syntactic position (($F(1,98) = 15.48$, $p < .001$) such that objects ($M = 2.92$, $S.D. = 1.22$) were significantly more acceptable than subjects ($M = 2.61$, $S.D. = 1.14$). There was no independent effect of context type on acceptability ($F(1,98) = .81$, $p = .37$ (n.s.)), indicating that neither NC ($M = 2.8$, $S.D. = 1.22$) nor DN ($M = 2.72$, $S.D. = 1.16$) contexts made the items more acceptable overall.

[11] Two of the control items had mean scores of 5.45, which was relatively low. These involved pronoun resolution across a relative clause boundary, which may have made them more difficult to process.

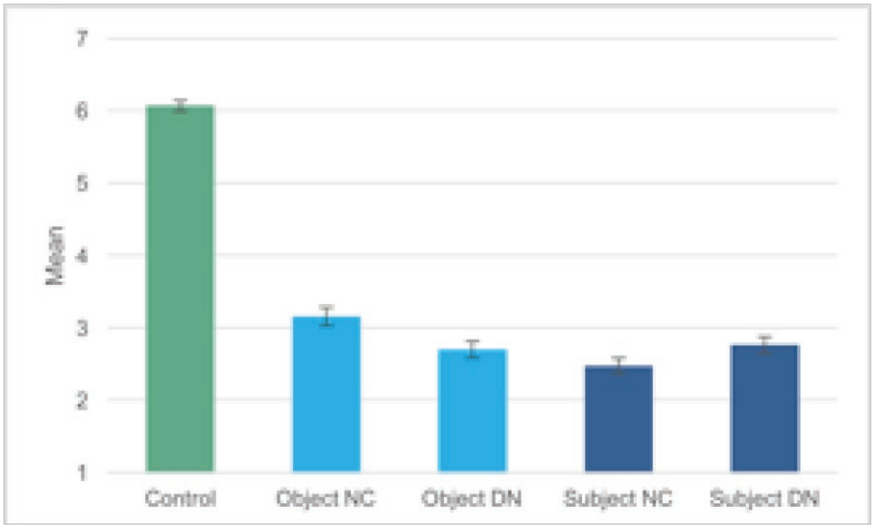

Figure 2: Context Group mean (S.E.) acceptability ratings (n = 99).

However, the ANOVA did reveal a significant interaction between syntactic position and context type ($F(1,98) = 19.62, p < .001$).

A series of paired t-tests were performed post hoc to determine the nature of the interaction in the Context Group results. These revealed a significant preference for Object NC ($M = 3.15$, $S.D. = 1.26$) over Subject NC ($M = 2.47$, $S.D. = 1.08$) ($t(98) = 5.85$, $p < .001$). This syntactic effect was not present in the DN condition, in which both Object DN ($M = 2.69$, $S.D. = 1.14$) and Subject DN ($M = 2.75$, $S.D. = 1.18$) items were equally (un)acceptable ($t(98) = .55$, $p = .58$ (n.s.)). They also revealed an effect of context type within the subject condition, such that Subject DN items were significantly more acceptable than Subject NC items ($t(98) = 2.48$, $p = .02$). Lastly, the t-tests revealed two significant effects of syntactic type across context conditions such that Object NC was significantly more acceptable than Subject DN ($t(98) = 2.85$, $p < .01$), and Object DN was significantly more acceptable than Subject NC ($t(100) = 2.10$, $p < .05$). Synthesizing these results, we have the following ordering of sentence type acceptability:

(28) Object NC > (Subject DN ≥ Object DN) > Subject NC

3.3 Summary and interim discussion

One clear finding that emerges from the results reported in this section is that participants found sentences with two negatives to be unacceptable overall. This was true regardless of the syntactic position of the negative noun phrase and regardless of context type. This indicates that if these acceptability data were collected in binary terms, they likely would not have revealed significant differences across syntactic or context type. One contribution of this study is thus that it illustrates how gradient acceptability can be used as a tool to detect differences across related sets of stigmatized sentence types. Related to this point, individual scores revealed that participant judgments were highly variable, with means ranging from 1 to 7. This suggests that some participants took a prescriptive approach to evaluating the test sentences while others took a more naturalistic approach.[12] Despite this individual variation, the results demonstrate that the participant group as a whole reliably distinguished between these two overall unacceptable sentence types.

[12] Supporting this, similar levels of individual variation were found in the other two negatives studies reported below, but not in the single negatives study.

The data were further shown to corroborate Smith's (2001) observation that Object NC is more commonplace in English than Subject NC, demonstrating that adult speakers of American English do in fact distinguish between Object and Subject NC (question (i)). Negative objects were more acceptable overall, and the Context Group results demonstrated that this preference was restricted solely to the NC condition. In this way, the results contribute to the broader understanding of micro-syntactic variation in English NC (and in NC grammars in general), supporting the notion that Object NC is fundamental, while Subject NC has special status. I further showed that this appears to be the case even for speakers who find NC unacceptable overall. Relatedly, this study asked whether the syntactic position of the negative quantifier in sentences with two negatives interacts with their interpretation as either NC or DN (question (ii)). This question was also answered in the affirmative, replicating the preference for objects in the No-context Group and further demonstrating the fundamental status of Object NC relative to Subject NC. This finding corroborates the casually observed interpretation patterns discussed in Section 2.3, in which sentences with negative objects naturally lend themselves to an NC interpretation whereas negative subject sentences are more naturally DN.

One curious effect that emerged from a comparison of the two studies is that mean acceptability ratings for the test items were lower overall for the Context Group than for the No-context Group. It is possible that, given that all participants in the Context Group judged both NC and DN items, once they had encountered an item of each type they were aware that they had to choose between these two interpretations, which made the task more challenging overall. Under this explanation, the additional challenge presented by the test items effectively degraded the acceptability of all items, which could explain why means for the control items were also not higher in the Context Group.

That the items were less acceptable in context has no direct bearing on the fact that, as this study demonstrates, adult native speakers of American English who find NC unacceptable nevertheless prefer Object NC to Subject NC, and also to DN in general. Because acceptability varies consistently depending on the syntactic position of the negative phrase, one might hypothesize that this variation is grammatical in nature. However, there remains a possible non-grammatical explanation for the two negatives results: negative subjects may have been degraded overall because they induce a heavier sentence-initial processing load, and, concurrently, negative objects may have been preferred overall because they are easier to process. In the next section I present the results of a follow-up study, which demonstrate that the two negatives results cannot be explained by processing effects.

4 Study II: Single negatives

4.1 Methodology

The single negatives study was designed to test the hypothesis that participants prefer negative objects because they are easier to process than negative subjects. The study replicated the design and protocol employed in the two negatives study, with a slight modification to the test items: the negative marker was removed, leaving only the negative noun phrase. The following are the single negative versions of test items (23) and (24):

(29) He took nobody on the trip.

(30) Nobody helped patients on that day.

As in the two negatives study, participants were separated into a No-context and a Context Group. However, because the items had only one negative per item, the DN contexts were no longer felicitous, hence only the NC contexts were used. Items were thus varied

solely according to the syntactic position of the negative noun phrase. For the sake of comparison, this study nevertheless included both a No-Context and a Context Group. If participants' preference for negative objects over negative subjects in the two negatives study was due to processing effects, then this preference should also be present in the single negatives study.

4.1.1 Participants

For the single negatives study, 202 adult native speakers of American English were recruited via Amazon's Mechanical Turk. Tables 4–6 contain their demographic information.

The results of the post hoc demographic survey revealed that, like in the two negatives study, participants represented a geographically diverse range of areas within the U.S., and were primarily college educated and from suburban environments.

The same post hoc questions regarding NC usage given to the two negatives groups were administered in the single negatives study. (See Section 3.1.3 above.) One participant reported to being an optional Object NC user, one reported to being a Subject NC and an optional Object NC user, and two reported to using only Subject NC. The remaining 198 participants reported to being non-NC users. As with the two negatives study, these participant reports should be interpreted with caution, and should not necessarily be taken as a direct reflection of participant NC usage given the heavy social stigma associated with this construction type.

4.2 Results

4.2.1 Single negatives No-context Group

Figure 3 illustrates the results of the No-context Group.

As Figure 3 shows, removal of one negative led to an increase in overall acceptability for the test items. Mean acceptability was 5.29 (*S.D.* = .97) for objects and 5.93 (*S.D.* = .85) for subjects, hence well above the median in both cases, as distinct from the two negatives study reported in Section 3. A one-way repeated measures ANOVA revealed a significant effect of condition on acceptability ($F(2,99) = 46.83$, $p < .001$). A series of post hoc paired *t*-tests were performed to determine the nature of this effect. These revealed a significant difference between the control ($M = 5.90$, *S.D.* = .59) and object conditions such that control items were significantly more acceptable than items with a negative object ($t(100) = 7.06$, $p < .001$), as well as a significant difference

Table 4: Participants' levels of formal schooling (N = 202).

	High School	College	Graduate Studies
Proportion	.282	.658	.059

Table 5: Participants' upbringing environment types (N = 202).

	Urban	Suburban	Rural
Proportion	.233	.530	.238

Table 6: Participants' regions of origin (N = 202).

	Northeast	Southeast	Midwest	South	Northwest	Southwest
Proportion	.272	.124	.243	.129	.099	.134

between the subject and object conditions such that negative subjects were also significantly more acceptable than negative objects ($t(100) = 9.33$, $p < .001$). No significant difference was found between the control and subject conditions, which were equally acceptable ($t(100) = .44$, $p = .66$ (n.s.)).

4.2.2 Single negatives Context Group

Figure 4 illustrates the results of the Context Group.

As the figure shows, critical items were once again well above the median, with mean scores of 5.76 (*S.D.* = .95) for objects and 6.06 (*S.D.* = .72) for subjects. A one way repeated measures ANOVA revealed a significant effect of condition on acceptability ($F(2,99) = 10.44$, $p < .001$). Post hoc paired t-tests determined that, as in the No-context group, this effect was due to a significant difference between the control ($M = 6.06$, *S.D.* = .69) and object conditions such that controls were significantly more acceptable than negative objects ($t(100) = 3.36$, $p = .001$), as well as a significant difference between the subject and object conditions such that subjects were significantly more acceptable than objects ($t(100) = 4.72$, $p < .001$). Again, no difference was

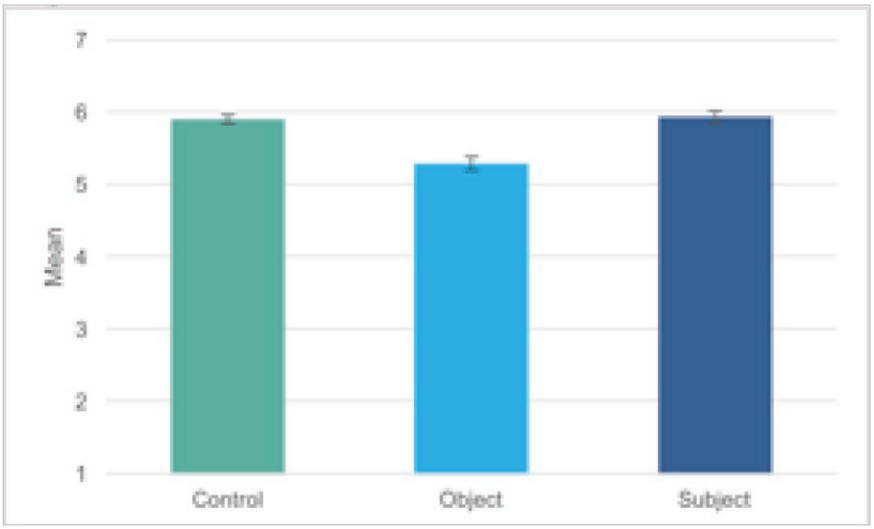

Figure 3: Single negative No-context Group mean (S.E.) acceptability ratings (n = 101).

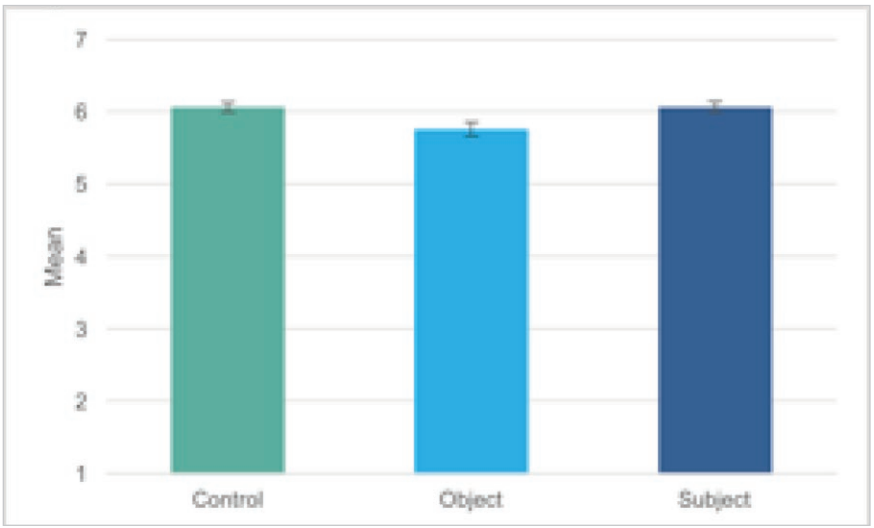

Figure 4: Single negative Context Group mean (S.E.) acceptability ratings (n = 101).

found between the control and subject conditions, which had nearly identical levels of acceptability ($t(100) = .02$, $p = .99$).

4.3 Interim discussion

The single negatives study was designed to inform the results of the two negatives study, in which objects were reliably more acceptable than subjects in both the No-context and Context Groups. The two negatives Context Group results suggested that the overall preference for objects was in fact a preference for Object NC over Subject NC, but the possibility remained that participants simply did not like sentence-initial negatives due to the fact that they induced a heavier processing load at the beginning of the sentence. The results of the single negatives study revealed a reliable preference for negative subjects over objects, both with and without a preceding context. These results thus strongly suggest that the object preference revealed in the two negatives study was not due to processing, but was rather a true syntactic effect.

The single negatives study informs and clarifies the results of the two negatives study, but it also raises some new questions. Why did participants prefer negative subjects over negative objects? And, relatedly, why were negative object items significantly less acceptable than both the control and the negative subject items? Two anonymous reviewers suggest that this may be related to the existence of a semantically equivalent, and perhaps more frequently occurring alternative NPI structure for the object items which does not exist for the subject items. For example, the sentence 'he took nobody' could alternatively and perhaps more commonly be realized as 'he didn't take anybody', whereas 'anybody didn't help patients' is not possible in American English. Thus participants may have liked the object items less than the subject items because they were in some sense comparing them to NPI constructions, whereas this was not the case with the subject items.

I set these questions aside here to return to the main focus of this paper, English sentences with two negatives. Like the single negatives study, the study presented in the next section also serves to inform the two negatives study reported in Section 3. In this case, it provides more information about the nature and extent of the unacceptability of DN constructions themselves, which were, perhaps surprisingly on some accounts, found to be less acceptable than NC.

5 Study III: Explicit DN

The two negatives study reported in Section 3 revealed the following ordering of acceptability in sentence types with two negatives (repeated from 28):

(31) Object NC > (Subject DN ≥ Object DN) > Subject NC

This ordering was revealed despite the fact that both NC and DN constructions were found to be unacceptable overall, and there was no independent effect of context type on acceptability. This is surprising under theories that separate NC and DN grammars, under which one or the other context type should be more acceptable. However, as discussed in Section 3.1.2, in order to control for the potential confound introduced by the provision of a single negation in the context when asking participants to judge both NC and DN constructions, DN items that required a denial interpretation had to be elicited via implicit negation in the context sentence. It is possible that this lack of explicit negation served to degrade the acceptability of the DN test items, and that these would have been judged acceptable in an explicit denial context. The study reported in this section thus informs those results by focusing solely on DN constructions in contexts that include an explicitly marked syntactic negation.

5.1 Methodology

The same recruitment and survey tools used for the two negatives and single negative studies were also used for the Explicit DN study. However, because this study focused specifically on DN constructions, there was only one participant group, and all participants judged the items following a single context sentence. The same 16 test items from the two negatives experiment were used, but the items themselves were modified slightly to make the denial interpretation maximally felicitous. The context sentences were distinct from Study I, and a dialogue format was used. The following example illustrates:

(32) Speaker A: I heard Dan took nobody on his trip up north.
Speaker B: Actually, he didn't take nobody. He took Tom.

As example (32) shows, the test item 'he didn't take nobody' serves to deny Speaker A's assertion that Dan took nobody on the trip, in which *nobody* explicitly marks a negation. In this experiment, the negative phrase in both negative subject and negative object items was included in Speaker A's assertion, and each test item functioned as an explicit denial of that assertion.

The same control and filler items used in the two and single negative studies were used here, and these items were also modified to fit the dialogue format. The following illustrates a control item:

(33) Speaker A: I heard there was an adult at the park watching over each kid.
Speaker B: Yeah, the tall woman watched the boy who was wearing the red hat while he played. And the man with red hair watched his daughter.

5.1.2 Participants

Tables 7–9 illustrate demographic information for the participants in the Explicit DN study.

As shown in Tables 7–9, the results of the demographic survey revealed that participants from all regions of the U.S. were represented, with the largest groups being from the south and the northeast. Just over half of the participants for this study were college educated and from suburban areas, while 36% reported ending their formal education after high school. For the post hoc NC usage questions, one participant reported to being an Object NC user (option (a) in post hoc question 1), one reported to using both Object NC and NPI constructions (option (c) in post hoc question 1), and the remaining 48 reported no NC usage.

Table 7: Explicit DN participants' levels of formal schooling (N = 50).

	High School	College	Graduate Studies
Proportion	.36	.54	.10

Table 8: Explicit DN participants' upbringing environment types (N = 50).

	Urban	Suburban	Rural
Proportion	.24	.58	.18

Table 9: Explicit DN participants' regions of origin (N = 50).

	Northeast	Southeast	Midwest	South	Northwest	Southwest
Proportion	.28	.10	.18	.28	.10	.06

5.2 Results

Of the 50 participants surveyed using the Explicit DN protocol, two were excluded due to a mean score below 4 in the control condition. Figure 5 illustrates the results for the remaining 48 participants.

As Figure 5 shows, the acceptable control items ($M = 6.15$, $S.D. = .77$) were more acceptable than both DN item types. Despite the inclusion of an explicit negation in the context, both Object DN ($M = 3.27$, $S.D. = 1.13$) and Subject DN ($M = 3.50$, $S.D. = 1.44$) constructions were judged unacceptable overall, with mean acceptability rates below the median of 4. A one-way repeated measures ANOVA revealed a significant effect of condition (control vs. object vs. subject) on acceptability ($F(1, 47) = 1152.44$, $p < .001$). Post hoc paired t-tests were employed to determine the nature of this effect. These revealed that controls were significantly more acceptable than both Object DN ($t(47) = 14.87$, $p < .001$) and Subject DN ($t(48) = 12.06$, $p < .001$). They further revealed that, like in the original two negatives study (see Section 3.2), although Subject DN was slightly more acceptable than Object DN, this difference was non-significant ($t(47) = 1.83$, $p = .07$ (n.s.)).

5.3 Summary and interim discussion

The results of the Explicit DN study demonstrate that even when an explicit negation is provided in the context sentence, speakers do not accept DN constructions overall. Mean acceptability ratings for the test items in this study ranged between 3.27 and 3.5. Despite the fact that this range was higher than in the original two negatives study, in which mean acceptability ranged between 2.69 and 2.75, it was still below the median. Furthermore, for both object and subject items, means were also significantly less acceptable than the control items. Explicit negation thus served to improve the overall acceptability of the DN items, but not enough to make them acceptable. This study therefore provides further confirmation for the finding in the original two negatives study that speakers simply do not accept English sentences with two negatives, regardless of context type.

Under the assumption that DN is grammatical for these native English speaking participants, the results also illuminate a clear case of asymmetry between sentence acceptability and grammaticality. As distinct from NC, DN constructions might be expected to be acceptable even from a prescriptive perspective, recalling Lowth's (1762) edict that two English negatives should equal an affirmative. As such, the consistently low ratings of the DN

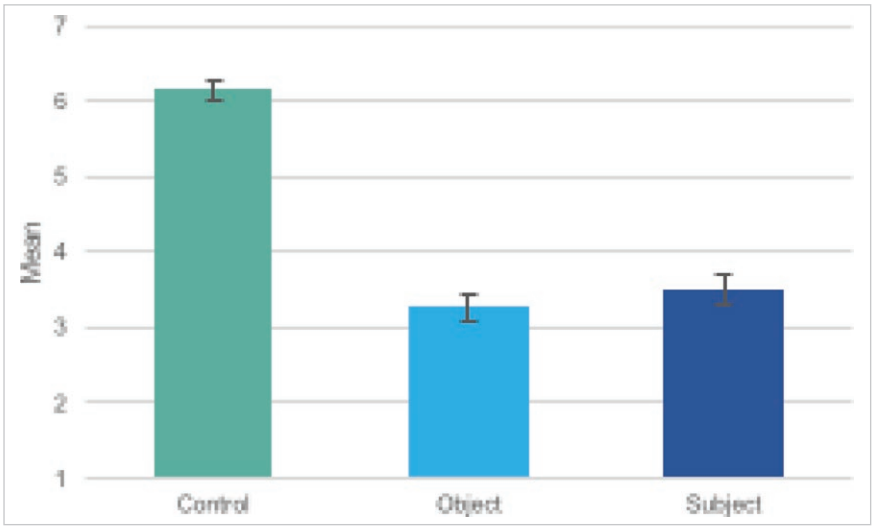

Figure 5: Explicit DN mean (S.E.) acceptability ratings (n = 48).

constructions suggests that their acceptability is status is influenced by extra-grammatical forces, possibly pragmatic in nature. This possibility is supported by the fact that, unlike NC, participants do not distinguish between the two DN syntactic types. While it is beyond the scope of this paper to determine the precise source of the overall unacceptability of DN, the results serve to support the conclusion that for English sentences with two negatives, acceptability stated in binary terms does not seem to reflect grammatical status.

Another finding that this study replicates is the absence of an effect of syntactic type within the DN condition. As in the two negatives study, though Subject DN was slightly more acceptable than Object DN, it was not significantly so. This finding is interesting given that the DN constructions employed in both studies are derived through interaction with the pragmatic context. This distinguishes them from constructions like the following, in which a significant syntactic boundary separates the negative marker and phrase (cf. Blanchette's 2013 "long distance DN"):

(34) The woman didn't write the book with no chapters.
'It is not the case that the woman wrote the book that does not have chapters.'

(35) The woman who didn't have time wrote no books.
'It is not the case that the woman who did not have time wrote books.'

In each case, a negation is embedded in a complex noun phrase and only a DN reading is possible, and in neither case does the DN construction serve to deny a previous utterance. The DN interpretations for these constructions are thus derived syntactically. The DN interpretations for the test items, on the other hand, are derived pragmatically, through interaction with the context sentence. The fact that no syntactic difference was found in these cases suggests that gradient acceptability is sensitive to modularity (in the sense of Chomsky 1995). While speakers overall do not like DN constructions that are derived pragmatically, statistical analyses of their judgments reliably demonstrate that syntax does not play a role in their unacceptability.

Continuing to examine sentences with two negatives, I return in the next section to NC. The study presented there also serves to inform the results of the original two negatives study, but in a manner distinct from the Explicit DN study presented here. Specifically, it aims to further investigate the Object NC preference, to better understand the nature of this syntactic effect.

6 Study IV: Three types of Negative Concord

This study simultaneously examines three types of NC: Object NC, Subject NC, and NAI (previously discussed in Section 2.3.1). The original two negatives study revealed a reliable preference for Object NC over Subject NC, suggesting a subject-object asymmetry akin to that found in non-strict NC varieties. However, as discussed in Section 2.3.1, NC NAI constructions also involve a negative subject, which appears following a negated auxiliary. It is therefore informative to see where these constructions fall in the acceptability schema delineated in the results of the original two negatives study. Under the hypothesis that Object NC and Subject NC instantiate two different grammars in English, this study aims to test whether NC NAI constructions belong to the Object NC Grammar, the Subject NC Grammar, or neither.

6.1 Methodology

Given that strings that yield NC NAI cannot be interpreted as DN constructions, they cannot be compared alongside DN as in the original study. Furthermore, because they are string equivalent to interrogatives, presenting them with no context would yield invalid

results, as there would be no way of knowing whether speakers judged them on their declarative interpretation. Therefore, like the Explicit DN study, this study had only a context group. Again, the same 16 object and subject test items were used, but in this case only the NC contexts were presented. An additional eight NAI items were added, one of which is illustrated here:

(36) The students had only five minutes to eat before leaving for school.
Didn't nobody finish their breakfast.

The same controls and fillers used in the two negatives and single negatives studies were also used here.

6.1.1 Participants

Tables 10–12 below illustrate participant demographics for the Three Types of NC study:

As shown in Tables 10–12, the results of the demographic survey revealed that participants in the Three Types of NC survey were mainly college educated and from suburban areas. For the post hoc NC usage questions, one participant reported to being an Object NC only user (option (a), post hoc question 1), one reported to using both Object NC and NPI constructions (option (c), post hoc question 1), and the remainder reported that they were non NC users.

6.2 Results

Figure 6 summarizes the Three Types of NC survey results.

A one-way ANOVA revealed a significant effect of syntactic type across the three NC conditions ($F(1, 49) = 30.56$, $p < .001$). A series of post hoc paired t-tests were performed to determine the nature of this effect. These revealed that, as in the two negatives studies, Object NC ($M = 3.35$, $S.D. = 1.35$) was significantly more acceptable than Subject NC ($M = 2.5$, $S.D. = 1.19$) ($t(49) = 7.09$, $p < .001$). They further revealed that NAI ($M = 3.36$, $S.D. = 1.07$) was also significantly more acceptable than Subject NC ($t(49) = 6.25$, $p < .001$). Lastly, no significant difference was found between Object NC and NAI, which had nearly identical levels of acceptability ($t(49) = .11$, $p = .91$ (n.s.)).

6.3 Summary and discussion

The results of this study both replicate and inform the original two negatives study finding that speakers who do not accept NC nevertheless have syntactic knowledge of it. On the basis of these results, NAI can be added to the acceptability schema for sentences with two negatives as in (36):

Table 10: Three types of NC participants' levels of formal schooling (N = 50).

	High School	College	Graduate Studies
Proportion	.28	.66	.06

Table 11: Three types of NC participants' upbringing environment types (N = 50).

	Urban	Suburban	Rural
Proportion	.34	.52	.14

Table 12: Three types of NC participants' regions of origin (N = 50).

	Northeast	Southeast	Midwest	South	Northwest	Southwest
Proportion	.28	.12	.20	.04	.16	.20

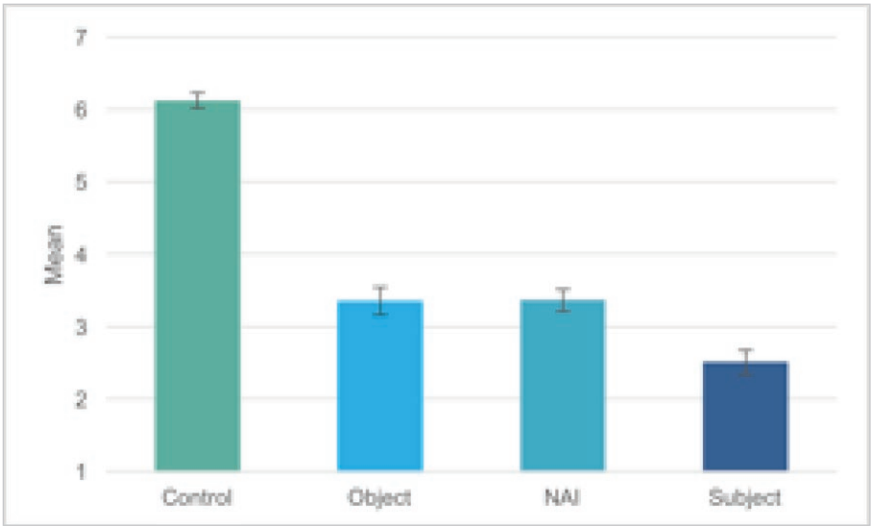

Figure 6: Three Types of NC mean (S.E.) acceptability ratings (n = 50).

(37) (NAI ≥ Object NC) > (Subject DN ≥ Object DN) > Subject NC

The schema delineates an Object NC and NAI Grammar on the one hand, and a Subject NC Grammar on the other (which, according to the usage patterns reported in Smith (2001) and as discussed by Tortora (2007) encompasses both Object NC and NAI). Under this hypothesis, the participants in this study, who represent a geographically diverse group of American English speakers, have Object NC and NAI Grammars.

The Three Types of NC results further demonstrate that the subject-object asymmetry found within the NC condition in the original two negatives study is in fact not that. Instead, it appears to be a condition on the syntactic position of the negative phrase relative to the marker: note that in the NC NAI constructions, the phrase is a subject, and yet these constructions pattern with Object and not with Subject NC.[13] What this series of studies reveals is therefore a syntactic condition within English NC constructions, which has clear theoretical implications. I address this finding in the next section, where I summarize the results of the four studies, and discuss what they imply for existing NC theories as well as methodologies for collecting data on stigmatized construction types.

7 Summary and implications

The four studies presented in this paper demonstrate several ways in which speaker performance reflects fine-grained syntactic knowledge of English negative sentences both below and above median levels of acceptability. This section summarizes and synthesizes the results of the studies in the context of previous research, and discusses what they imply for theoretical models of NC.

7.1 Summary and methodological implications

The first study reported in Section 3 demonstrated that sentences with two negatives are unacceptable both with and without a context, and that this is true regardless of whether the context is NC or DN. The study further revealed a reliable preference for negative objects both out of context and in NC contexts. The reverse syntactic effect was found in the single negatives study, in which subjects were preferred.

Taken together, these findings suggest that, for speakers who do not accept or generally report to using NC, the default, out of context interpretation of sentences with two

[13] Thanks to a very helpful anonymous reviewer for pointing out this distinction.

negatives is in fact the NC interpretation. This finding is distinct in an interesting way from the study reported in Thornton et al. (2016), in which adult speakers of Australian English performed better with DN items than with NC. As illustrated in Section 2.2.2, the test sentences Thornton et al. employed were in fact very similar to the items in the Object condition of the two negatives study, thus while their study tested comprehension and not acceptability, comparisons can be drawn.

Why would speakers prefer Object NC over DN in general, but reliably fail to select the NC option in contexts that elicit the single negative interpretation? This difference in results could be explained by the possibility that, as discussed in Section 2.2.2, Thornton and her colleagues' results reflect the effects of prescriptivism, which were controlled for in the current study through the use of a gradient acceptability scale. Alternatively, the different results could be attributable to genuine grammatical differences between Australian and American English, or, a performance difference between NC acceptability and comprehension, which may have an underlying grammatical source. Deciding between these options is a matter for future research. However, the data from the studies reported in this paper demonstrate that binary choices between English NC and DN, which the Thornton et al. study employs, obscure adult grammatical knowledge of NC. This fact should henceforth be taken into account in designing and evaluating methodologies for experimental studies of English NC.

The single negatives study reported in Section 4 revealed that when the negative marker is removed and only a single negative phrase is included in the sentence, the two negatives effect is reversed, and subjects become significantly more acceptable than objects. The Explicit DN study further confirmed that even in contexts where DN sentences deny a previous syntactic negation introduced in the discourse, speakers do not accept DN. Additionally, it showed that while NC sentences display microsyntactic variation in their acceptability, DN sentences do not, and both Object and Subject DN constructions are equally unacceptable, just as in the original two negatives study. Lastly, the Three Types of NC study revealed that the acceptability of NAI is equivalent to that of Object NC, and superior to Subject NC and to DN in general (at least where no explicit negation is provided in the context sentence).

With the exception of the single negatives study, all of the syntactic effects reported in this paper were discovered below the median level of acceptability. Furthermore, even when median acceptability levels were exceeded, interesting syntactic differences were revealed. This has methodological implications for the study of English NC, as well as broader implications regarding the use of traditional binary acceptability judgments in the construction of syntactic theories. Sprouse (2016: 90) lays out three open questions in experimental syntax. He asks (i) whether the published data underlying syntactic theories are valid, (ii) whether we can determine the source of differences in acceptability judgments, and (iii) what gradient judgments tell us about grammar architecture. The collective data reported in this study bear on all three of these questions.

The comparison between the two and single negatives study sheds some light on question (ii). The fact that subjects were more acceptable in that study allowed for the ruling out of a processing explanation for the two negatives object effect, and supported the hypothesis that the source of the difference in judgements for the two negatives items is the grammar itself. This study therefore contributes toward showing that gradience can help distinguish between performance effects due to constraints on processing and those shaped by grammatical mechanisms.

As for (iii), I have argued that the collective results of the studies suggest the existence of an English grammar that contains Object NC and NAI but not Subject NC. This implies a hierarchy in which negative phrases in English NC must appear in a

syntactic position below the negative marker, similar to prototypical Non-Strict NC languages. If gradient acceptability had not been employed, this hierarchy would have remained obscured, and all three NC construction types would appear to have the same grammatical status.

The results reported here also bear on the question in (i), which asks whether the published data underlying syntactic theories can be assumed to be valid. To see how, let us consider the published data in Puskás (2012), in which English is taken to be a non-NC language (Puskás 2012: 641).[14] The following examples serve to illustrate (Puskás 2012: 643):

(38) #No new film appeared in none of the cinemas downtown.

(39) Never have I bought nothing for your birthday.

Though it is not stated explicitly, let us assume that Puskás's informants would report to not accepting an NC interpretation for either of these examples, and that both must be interpreted as DN.[15] It is unclear, however, that this is an accurate empirical characterization of the facts, because as the data in the current paper show, people who do not accept NC nevertheless appear to have grammatical knowledge of it. Therefore, it might be desirable to revisit syntactic theories based on binary judgments of English sentences with two negatives in light of these new gradient data, and it may prove useful and theoretically informative to explore the various construction types analyzed in both NC and DN contexts using gradient acceptability judgments. Even if the original findings are straightforwardly confirmed, the systematic comparisons that form part of the experimental design could lead to a refined understanding of the differences between various sentence types, as well how they interact with pragmatic context.

7.2 Theoretical implications: Support for micro-parametric approaches

In Section 2 I laid out the hypothesis that the diachronic shift away from NC usage reflects only a surface change, and that NC continues to be grammatical in English even in those varieties in which it is not used.[16] The data from the four studies presented above support that hypothesis, in that they reflect refined knowledge of the syntactic distribution of NC in speakers who do not accept or report to using it. These results thus bear directly on current theoretical debates on how negation and Negative Concord should be represented in the grammar. This section discusses how these new data can inform these debates. I argue that they support approaches that model both NC and DN in a single grammar over those that assume grammars can only be either NC or DN.

7.2.1 The macro-parametric approach

Zeijlstra's (2004) widely accepted approach takes a macro-parametric view of how NC is (or is not) instantiated in natural language (Déprez 2011). Under his approach, grammars are either NC or DN. In NC grammars, morphologically negative elements are endowed with an uninterpretable negative feature [*u*NEG] which must Agree in the syntax with an interpretable negative feature [*i*NEG] introduced within a negative phrase (NegP). In DN grammars, morphologically negative elements are independently semantically negative, and there is no Agree hence no concord. The difference between NC and DN grammars

[14] Puskás (2012) deals primarily with Hungarian data, but contains one of the relatively few published syntactic models that treats English DN directly.

[15] In my judgment, as a native English speaker who does not use NC, (37) is perfectly felicitous as an NC construction, while (38) lends itself more to a DN interpretation.

[16] See Barbiers (2005, 2009) for discussion of grammatical but "unrealized" structures.

thus reduces to the featural makeup of the language's negative elements in conjunction with the presence (or absence) of a NegP.

Consider this theory in the context of the new data reported in this paper. As illustrated in Section 6.3, speaker judgments reflect the following ordering of sentence type acceptability:

(40) (NAI ≥ Object NC) > (Subject DN ≥ Object DN) > Subject NC

I propose that, in conjunction with the usage and interpretation patterns discussed in Section 2, this schema reflects an English grammar that generates Object NC and NAI but not Subject NC, and that generates certain DN constructions through interaction with pragmatic context. In short, this is a grammar that generates both NC and DN, contrary to what Zeijlstra's (2004) approach predicts.

7.2.2 Support for micro-parametric approaches

The data presented in this paper support approaches to modeling NC that allow it to be generated alongside DN in a single grammar. There exist several such approaches. Like Zeijlstra (2004), Déprez (2011) appeals to the featural makeup of the negative phrases in explaining whether or not they can enter into concord. However, unlike Zeijlstra, she proposes that an element's ability to enter into concord will depend on interactions between the locus of the negative feature within the noun phrase and the phrase's internal structural complexity. The availability of NC thus varies at the level of the word or phrase as opposed to the entire grammar. As such, though constructed primarily on the basis of Romance and through examining NC and DN relations between two or more phrases (as opposed to a phrase and a marker, as in the test items employed in this study), it would be useful to extend Déprez's (2011) approach to English, an exercise that could be undertaken by applying the methodologies employed in the studies presented above.

Longobardi (2014) represents another micro-parametric approach that accounts for the coexistence of NC and DN. Under his proposal, morphologically negative elements vary with respect to how they are valued for the features [+/–NOT] and [+/–ANY], where [+ANY] instantiates the concord relation. He shows how this feature geometry accounts for whether a grammar allows negative phrases to enter into concord from pre-inflectional positions, thus characterizing the difference between Strict and Non-Strict NC languages. Although Longobardi assumes English has only DN, the schema illustrated in (39) demonstrates that his theory may extend straightforwardly to the data presented in this paper, particularly given that the Object NC + NAI combination differs crucially from Subject NC with respect to the position of the negative phrase in relation to inflection. However, any extension of this approach should also take into account the data that distinguish English from both Strict and Non-Strict NC languages as described in Tubau (2016) and Henry (2016), and illustrated in Section 2.3 of this paper.

An additional micro-parametric approach in Blanchette (2015) treats English NC directly. Unlike Déprez (2011) and Longobardi's (2014) feature based accounts, this model derives NC by syntactic movement. Her analysis builds on Postal's (2005) novel proposal, and Collins and Postal's (2014; henceforth CP) extension, that NPIs are negation-containing phrases, and that NPI constructions involve syntactic raising of the negation from the NPI. She extends this theory to English NC, proposing that the NC interpretation of a sentence like (41) is derived by movement and the spell-out of the negation in both its base and raised positions (42), whereas the DN interpretation involves the introduction of two distinct negations (43):[17]

[17] This proposal follows Collins et al.'s (2017) analysis of the Niger-Congo language of Ewe.

(41) He didn't take nobody on the trip.

(42) He didNEG_1 take [NEG_1 SOME body] on that trip.

(43) He didNEG_2 take [NEG_1 SOME body] on that trip.

Blanchette further proposes a variable rule prohibiting remnant movement of the negative phrase beyond a raised occurrence of NEG, which rules out Subject NC in grammars such as the one delineated in the experimental results presented here.

It remains to be seen whether Blanchette's (2015) approach can also account for the data presented here, in which NAI was shown to cluster with Object and not Subject NC. However, mechanical details aside, approaches such as these, which account for NC and DN in a single grammar, are a better representation of the facts than those which separate NC and DN into two different grammars. The new data reported in this paper demonstrates that these two construction types seem to be able to coexist in grammars, even for speakers who do not accept or report to using NC. This is unexpected and unaccounted for by the predominant macro-parametric approach to modeling NC.

8 Conclusions

This paper presented new data on the acceptability of English negative sentences. While English NC has long been described as unacceptable, this paper documents and explores the nature of this unacceptability. The data demonstrate that native American English speaking adults who do not accept or report to using NC nevertheless have grammatical (or syntactic) knowledge of it. The fact that these patterns of micro-syntactic variation in English NC can be uncovered through the use of gradient acceptability illustrates how this methodological tool can be used fruitfully to explore systematic variation within and across other socially stigmatized construction types.

Abbreviations

AAPCAppE = Audio-Aligned and Parsed Corpus of Appalachian English, DN = Double Negation, NC = Negative Concord, NAI = Negative Auxiliary Inversion

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Competing Interests

The author has no competing interests to declare.

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