Abstract

In this study, we examine stress on the English first singular subject pronoun I in a corpus of conversational American English. Close to 2,000 tokens were rated auditorily as either stressed or unstressed, with the most reliable acoustic cue for perceived stress found to be duration. While stress is widely held to express contrast, implementation of three operationalizations shows that example-by-example classification of instances as contrastive fails to provide an account of stressed I. However, identifying co-occurrence patterns through multivariate analysis, we find that contributing to speakers' choice of stressed I are accessibility (measured in distance from the previous mention) and contrast (in a semantic sense, as measured by a polarity effect, and interactionally, as per a speaker-turn effect), but the set of constraints jointly accounting for the variation includes mechanical priming (with clusters of co-referential stressed I) and formulaicity (with particular constructions (dis)favoring stress).

1 The discourse function of stress

What is the function of stress on the English subject pronoun I? According to Pierrehumbert and Hirschberg (1990: 288), sentence-level stress is used to “render salient the material with which [it is] associated” in both a prosodic and “informational” sense. There have been two ways in which the “informational salience” of prosodic stress has been interpreted, one relating to the cognitive notion of accessibility, and the other to the pragmatic notion of contrast.

From a cognitive perspective, stress has been said to correlate with the information status of a referent. It is widely accepted that, cross-linguistically, referents that are newly introduced into the discourse (“new” or “inactive information”) receive more linguistic coding than referents that have previously been introduced (“old” or “given information”) (Ariel 1990; Chafe 1994; Du Bois 1987; Givón 1983b; Levinson 1987; Prince 1981, inter alia). Thus, new information is more likely to be introduced with full NPs, and old information with pronouns; or prosodically, new information is more likely to be stressed, and old information unstressed (Givón 1983b: 17; Hirschberg and Pierrehumbert 1986: 141). The structural correlates of information status, however, have been most widely considered for third person, as first person is generally understood to be given.

An alternative account for stress has been a pragmatic one, tied to the notion of contrast. This has been applied in particular where issues of information flow seem to be less relevant, such as for pronouns, which tend not to represent new information (Chafe 1994: 79; Givón 1983b: 17). Chafe, while recognizing that the first person pronoun may be stressed when the referent has receded from “active consciousness” (1994: 87), also writes that “….the principal

1 Sentence-level stress differs from word-level stress, which is a phonological property of lexical items. While the former is variable, the latter is fixed; for example, the verb and noun written as suspect are two different words, distinguished through having the stress on distinct syllables: to suspéct / a súspect).

2 We note that some scholars (e.g. Levinson 1987) consider information flow to be in the purview of pragmatics; we follow Chafe (1994) and (Givón 1983b) in viewing it as a primarily “cognitive” notion, and reserve “pragmatic” for the positioning of interlocutors.
condition under which given items (including those that are pronominalized) receive the intonation peak of a sentence is [...] when they are [...] a focus of contrast” (1976: 35). Likewise, in discussing anaphoric and deictic items, which are “inherently given”, Halliday notes that “Typically, these items do not carry [...] [stress]; if they do, they are contrastive” (1994: 298) (cf. also Givón 2001: 251). However, none of these works report an empirical test of the relationship between stress and the notion of contrast.

In this research, we operationalize and test accounts appealing to accessibility and contrast, with an analysis of the linguistic conditioning of stress on the pronoun I based on distribution and co-occurrence patterns in American English conversation. We begin by presenting the corpus and the coding of tokens for stress, finding duration to be the best acoustic cue for the perception of stressed I. In Section 3, we implement operationalizations of contrast elaborated in previous studies for other linguistic phenomena. These operationalizations point to some contrastive uses for stressed I but have limited explanatory power as they apply to exceedingly small proportions of the data. Section 4 presents a multivariate model of discourse features associated with stress on I, which indicates that speakers choose stress on the first singular subject pronoun when it is less accessible—when the previous mention occurs at a distance of three or more clauses—but also in coreferential contexts when it is primed by a preceding stressed I, a mechanical effect. Stressed I is likewise favored by negative polarity and in turn-initial position—two contexts that lend themselves to setting up contrast, in a semantic and interactional sense. Stress on I is least likely in prefabricated discourse formulas, but two lexically particular constructions (I don’t know (CLAUSE) and I would VERB) show higher than average rates of stress. We conclude that both accessibility and contrast accounts do offer some explanation of the patterning of stressed I, but that a better explanation is found through the set of constraints jointly accounting for the variation, including mechanical and interactional factors, as well as formulaicity.

2 Data: coding for stress in naturalistic speech

2.1 Speakers and transcription of speech

The data for this study are drawn from the Santa Barbara Corpus of Spoken American English (SBCSAE) (Du Bois 2000; Du Bois et al. 2003; Du Bois and Englebretson 2004, 2005). The SBCSAE is a publically available corpus of recordings of naturally occurring face-to-face spoken interaction which have been carefully transcribed to include prosodic information. For this study, we use 20 conversations (approximately 85,000 words, drawn from SBCSAE I, II, IV). In this portion of the corpus, a total of 60 speakers are represented, 35 females and 25 males from across the United States, ranging from 11 to 76 years of age (though primarily between the ages of 20 and 60), the majority Anglo Americans with a high school or college education.

As illustrated in (1), each line of transcript represents a distinct Intonation Unit (IU), which is characterized as “a stretch of speech uttered under a single, coherent intonation contour” (Du Bois et al. 1993: 47). The transcription method also includes the annotation of features such as pauses, laughter, overlap, inhalation and so on, which may play a role in the interaction between the interlocutors. (See the Appendix for a list of the transcription conventions.) In this and subsequent examples, stressed I is marked with an asterisk (I*) and

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3 The conversations from which tokens were extracted are SBCSAE 01, 02, 03, 04, 05, 06, 07, 15, 16, 17, 18, 19, 45, 46, 47, 48, 49, 50, 51, 52.
unstressed \( I \) is left unmarked (\( I' \)); tokens that taggers did not agree on are marked with a question mark (\( I'' \)).

(1) Lynne:  
I mean whether the horse being used a lot or not,  
that's twelve bucks.  
and,  
(H)=... shoot,  
I* can do those,  
you know?  
... But,  
I? always have,  
anybody --  
(H) I always have somebody that really knows what they're doing,  
for the horses that I'm really really using.

(01 Actual Blacksmithing: 595-605)

2.2 Coding auditorily for stress

All first person singular \( I \) tokens in the published transcripts of the 20 conversations used here (\( N = 3,040 \)) were identified and marked out in a file in the program Transcriber, where they were linked with the corresponding audio. These excerpts consisted of primarily only the Intonation Unit in which the token of \( I \) appeared, so that the perception of stress would rely as much as possible on auditory impressions rather than on expectations based on lexical-grammatical features of the fuller discourse context.\(^4\) Tokens were then coded for perceived stress by four linguistics graduate students, native speakers of American English, who listened to the excerpts and classified the \( I \) as stressed, not stressed or of undeterminable status.

Each rater tagged subsections of the data, such that each token was independently tagged by three different raters. The raters either disagreed about the status of stress (\( N = 1,028 \)) or agreed that it was undeterminable (\( N = 13 \)) on approximately one third of the tokens (34%, 1,041/3,040). Setting aside tokens of \( I \) without a verb (e.g. \( I \) just --, \( N = 129 \)) and those occurring in unclear speech (marked as \( <X>X> \) in the transcriptions, \( N = 18 \)), agreement about the status of stress was reached by all three raters on 1,538 (174 stressed and 1,364 unstressed) tokens and by two raters with the third rater identifying the status as undeterminable (referred to here as “two-way rater agreement”) on a further 323 (72 stressed and 251 unstressed). The first column in Table 1 summarizes the results of the auditory coding of stress.

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\(^4\) In some cases, surrounding material was included (in particular, preceding discourse markers, e.g. \( \text{well, I know} \), or following material to complete a larger constituent, e.g. \( \text{I would come in at nine, and work till nine} \)).
### Table 1: Coding for stress of 1sg subject pronoun I

<table>
<thead>
<tr>
<th>Tagging results</th>
<th>N</th>
<th>% data: all tokens (N=3,040)</th>
<th>% data: tokens retained for analysis (N=1,861)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 raters tagged as stressed</td>
<td>174</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>2 raters tagged as stressed, 1 as undeterminable</td>
<td>72</td>
<td>2%</td>
<td>13%</td>
</tr>
<tr>
<td>3 raters tagged as unstressed</td>
<td>1,364</td>
<td>45%</td>
<td></td>
</tr>
<tr>
<td>2 raters tagged as unstressed, 1 as undeterminable</td>
<td>251</td>
<td>8%</td>
<td>87%</td>
</tr>
<tr>
<td>Raters disagreed</td>
<td>1,028</td>
<td>34%</td>
<td></td>
</tr>
</tbody>
</table>

We then conducted acoustic analysis to determine whether the auditory classification of tokens was reliable based on objective measures of difference. A second goal of the acoustic analysis was to determine whether the tokens with two-way rater agreement (where two raters classified as stressed or unstressed, and the third as undeterminable) could be pooled with the tokens agreed upon by all three raters.

### 2.3 Acoustic correlates of perceived stress

Prosodically, stress comprises a set of phonological features that together render material more prominent or salient than surrounding material (Pierrehumbert and Hirschberg 1990: 288). Studies of elicited or otherwise controlled production data have identified these features as duration, pitch and intensity, though there has been disagreement about the relative contribution of each measure (e.g., Fry 1955; Gay 1978; Kochanski et al. 2005).

Figure 1 and Figure 2 below depict two example tokens drawn from our data of stressed and unstressed I respectively, as perceived by the raters. Each figure provides measures of intensity (in decibels, indicated by a solid line), pitch (in hertz, indicated by a dotted one), and duration (in milliseconds, reported below each figure). In these particular tokens, stressed I is nearly three times as long as unstressed I (duration = 177 ms vs. 61 ms), is louder (peak intensity = 81.08 dB vs. 62.85 dB) and displays a peak pitch that is twice as high as that of the unstressed token (pitch peak = 350.1 Hz vs. 173.25 Hz).

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5 Thanks to Colleen Balukas for the acoustic analyses and her contributions to this section. We also thank Nicole Benevento for the statistical analysis of the duration means, Tim Poepsel for the Praat script used to extract measurements and Chip Gerfen for his advice on the acoustic analyses.
Some tokens of I perceived as stressed or unstressed could not be included for acoustic analysis because of overlapping speech or background noise; what raters perceived as an unstressed I in some cases did not even register as a blip in the wave form. Thus, acoustic analysis was conducted on the measurable tokens of stressed I with three- and two-way rater agreement (N = 142 and 52 respectively), together with matching samples of unstressed I with three- and two-way rater agreement, resulting in a sample of 388 tokens for acoustic analysis. Samples were matched by speaker, and also by contraction type (contracted vs. uncontracted) in 88% of the cases and voice quality of the following phonological segment (voiced vs. unvoiced) in 93% of cases; in 62% of cases the tokens were matched exactly by the following phone (e.g., [w], as in Figure 1 and Figure 2) (Balukas et al. 2012). A total of 45 speakers are represented in the acoustic analysis, ranging between 20 and 60 years old, 25 females and 20 males, with 61% (236/388) of the tokens produced by female speakers.

Audio files were extracted from the longer interviews and annotated with textgrids in Praat, a software program widely used in acoustic analysis (Boersma and Weenink 2011).
relevant measurement information—duration, intensity and pitch—on all tokens was extracted by means of a Praat script. Figure 3 depicts boxplots for these three measures.\(^6\)

For each measure, compared are four types of stress: stressed \(I\)—three-way rater agreement; stressed \(I\)—two-way agreement; unstressed \(I\)—two-way agreement; unstressed \(I\)—three-way agreement. These boxplots show that for intensity and pitch (the second and third boxplots respectively), there is overlap in the distributions of each stress type even with three-way rater agreement, depicted in the left- and right-most boxes. For duration, however, there is no such overlap, and there is a significant difference in the mean duration of stressed versus unstressed tokens for both three-way and two-way rater agreement, indicating that this is the most reliable cue for the perception of stress.\(^7\)

This analysis is sufficient to support our claim that tokens of \(I\) independently tagged the same way by the raters as perceived to be stressed versus unstressed differ fundamentally at the acoustic level. In addition, based on the duration measurements, we can pool instances of two- and three-way rater agreement. Pooling these tokens, we obtain an overall rate of stressed \(I\) of 13% (346/1,861), as shown in the second column in Table 1 above.

Note that all of the measurements on \(I\) were taken in complete isolation. A worthwhile comparison might be made between the \(I\) measurements and the surrounding words, and examination of the acoustic properties of the tokens upon which the raters failed to agree would give us a stronger statement of the contribution of duration, intensity and pitch to the perception of stress. It may also prove fruitful to examine whether the disagreement rate of approximately one third shown in the bottom row of Table 1 has to do with the nature of the data or with the raters. We do not pursue these avenues here, as our purpose was to obtain a sample of tokens classified as stressed and unstressed in order to investigate speakers’ choices.

We now turn to identifying features of the discourse context associated with speakers’ choice of stressed \(I\), beginning with a consideration of the contrastive function of stress.

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\(^6\) Boxes represent the middle 50% of the data points, with the horizontal line representing the median value and the vertical lines extending above and below each box the top and bottom 25% of the distribution respectively.

\(^7\) The mean duration of stressed and unstressed \(I\) (shown in Figure 3) is significantly different for both three-way agreement (paired \(t(141) = 14.03, p = .000\)) and two-way rater agreement (\(t(51) = 4.12, p = .000\)). The means for intensity (\(t(141) = 5.69, p = .000\)) and pitch (\(t(141) = 3.91, p = .000\)) of stressed and unstressed \(I\) are different for with three-way rater agreement, but not with two-way agreement (intensity: \(t(51) = 1.13, p = .263\); pitch: \(t(51) = -.80, p = .427\)). For the pitch measurements, the stressed and unstressed means for two-way rater agreement seem reversed, though the medians (the horizontal line in the boxes) appear to follow a more “expected” pattern.
Figure 3: Boxplots for measurements of duration, intensity, and pitch (for stressed I, three- (3/3) and two-way (2/3) rater agreement, and unstressed I, two- (2/3) and three-way (3/3) agreement).

<table>
<thead>
<tr>
<th></th>
<th>Duration</th>
<th>Avg Intensity</th>
<th>Avg Pitch</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (sec)</td>
<td>Mean (Db)</td>
<td>Mean (Hz)</td>
</tr>
<tr>
<td>Strs 3/3</td>
<td>.15</td>
<td>71.17</td>
<td>225.17</td>
</tr>
<tr>
<td>Strs 2/3</td>
<td>.14</td>
<td>66.35</td>
<td>194.24</td>
</tr>
<tr>
<td>Unst 2/3</td>
<td>.11</td>
<td>64.43</td>
<td>209.55</td>
</tr>
<tr>
<td>Unst 3/3</td>
<td>.09</td>
<td>66.73</td>
<td>187.97</td>
</tr>
</tbody>
</table>
3 Contrast

Contrast has been called upon to explain several different syntactic phenomena across languages besides stress, including subject expression (e.g., Aijón Oliva and Serrano 2010: 9; Luján 1999: 1277; Posio 2011: 778; Silva-Corvalán 1982: 853), case markers (e.g., Japanese wa, Kunio 1973), cleft constructions and other marked clause structures (e.g., Bosque 1999; Sedano 1994), word order (e.g., Myhill and Xing 1996; Ocampo 1995; Sun and Givón 1985), among others. However, in these works, there is no (standard) definition of contrast, as noted by Myhill and Xing (1996: 308), who comment on the “lack of explicitness and uniformity among linguists regarding the notion of ‘contrast’” (cf. also Mayol 2010: 2497; Silva-Corvalán 2003: 851), thus rendering analysts’ intuition-based classification of instances of contrast nonreplicable.

For example, in (2), I know somebody who makes a living as a musician marked at the arrow could be seen as contrasting with Frank and Ron’s opinion that musicians earn very little money. But to avoid a circular argument, replicably classifying this instance as contrastive requires evidence independent of the stress on I itself (indicated with the *).

(2)

Ron: You can't live off of it. (referring to being a musician))
Frank: .. No no. It's it-- I think,
... for .. performances,

➔ Brett: [I* know somebody who makes a] living as a d- musician.

Three studies that have sought to operationalize contrast are Sun and Givón (1985) based on “Potential Referential Interference” (PRI), or the mention of semantically compatible referents in the immediately preceding discourse, Myhill and Xing (1996) based on the notion of “double contrast”, or pairs of clauses that differ in two ways, and Travis and Torres Cacoullos (2012 (To appear)) based on interaction between interlocutors, through the juxtaposition of speaker and interlocutor self-reference. In order to determine to what degree the notion of contrast defined in these three ways is a determinant of speaker choice, we test how well these models account for stress on I in the corpus under study, as we describe below.8

3.1 Potential Referential Interference (PRI)

Givón’s (1983a) influential cross-linguistic study on topic continuity established that less continuous referents (or referents that are lower on the accessibility scale) tend to be associated with more linguistic coding, such as stressed, as opposed to unstressed, pronouns (1983b: 17) (See Section 4.1 for more detailed discussion). Givón (1983b: 14) proposes “Potential Interference” (or “ambiguity”) as one measure of accessibility, based on how many referents have been mentioned in the recent discourse, or how many referents the listener needs to retain in their consciousness (cf. Chafe 1994). This notion is applied as a test of

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8 We tested PRI and double contrast on a subset of the data, extracting 80 consecutive tokens of I from each of seven transcripts, beginning with IU #10 of the transcript. We retained a total of 470 tokens in which the rate of stress was 19% (88/470), after excluding 17 tokens of I guess and 73 tokens of I mean, which occur (near-) categorically with unstressed I.
contrast by Sun and Givón who propose that Potential Referential Interference (PRI) “is a good diagnostic for contrastive / emphatic constructions, since what is contrasted is normally a referent in the directly preceding discourse environment” (1985: 341).

Sun and Givón operationalize PRI as “the number of other referents in the directly preceding discourse environment – most commonly 3 clauses – that are semantically compatible with the predicate of the referent under consideration” (1985: 331). In order to test this operationalization for stress on I, we coded for the number of human referents that are semantically and pragmatically compatible with the subject of the target clause in the 10 IUs immediately preceding the target mention.9 Following the methodology outlined in Travis and Torres Cacoullos (2012 (To appear)), itself based on Sun and Givón, singular and plural referents in any syntactic role were included as potentially “interfering” referents, as were referents mentioned by any of the participants, essential in this interactive data (an issue not arising in Sun and Givon’s study of monologic narrative data). A you coreferential with I was not considered to “interfere”, but a non-coreferential you or I was, as was we, regardless of whether it included the target 1sg subject since, even in such a case, it does not have identical reference to the target subject (e.g., we’re pulling up, .. and I see this gir=l). A personal pronoun metonymically representing an entity was also included (e.g., to refer to a radio station They have a Brazilian ja=zz hour). Not considered to be potentially interfering referents were non-referential NPs (e.g., Or do Indonesian people look Black); indefinite pronouns (e.g., Who knows what death is); impersonal pronouns (e.g., legally you have to have eighteen); fixed expressions (e.g., I mean and you know), subjects of imperatives, and vocatives.10

The following example illustrates the application of this protocol. Here the target tokens appear in lines 10 and 20, and are marked in bold and with an arrow, and the potentially interfering referents are double underlined and numbered. The first token of I in line 10 has a PRI of one: within the preceding 10 IUs, there is only one semantically compatible referent mentioned (though it is mentioned five times). The second token of I in line 20 illustrates the other extreme with a PRI of five (note that they in line 19 is coreferential with Cathy and Jawahar, and thus is not counted as a distinct referent). This example concords with the predicted pattern: the I with a low PRI of one is unstressed, while the I with a high PRI of five is stressed.

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9 An overwhelming majority (97%, 775/796) of tokens coded as being at a distance of three or fewer clauses occur at a distance of fewer than 10 IUs, and likewise, the majority (84%, 775/925) of tokens coded as being at a distance of fewer than 10 IUs occur at a distance of three or fewer clauses. Thus, the measure of 10 IUs provides an appropriate comparison with analyses of PRI based on three clauses (Sun and Givón 1985; Travis and Torres Cacoullos 2012 (To appear)).

10 Clauses produced in overlap with the target clause were not counted as part of the preceding three clauses but those produced in overlap with each other, but not with the target clause, were counted as distinct clauses.
(3)

1. Lenore: He has a restaurant or something,
2. [or what does he do],
3. Alina: [(H)=]
4. Lenore: or wh- --
5. Lenore: [Who is he].
6. Alina: [He's, a waiter].
7. .. He's a waiter at Rosa's.
8. out there [in Ontario].
9. Lenore: [(Hx)]
10.➔ Alina: which is a very nice restaurant I'm sure, [PRI = 1]
11. Alina: but,
12. .. he wants to open his own restaurant someday,
13. and he thinks,
14. .. we're gonna finance it.
15. Lenore: .. (Hx)
16. Alina: .. (TSK) Actually thinks Cathy and Jawahar are,
17. or,
18. .. Jonathan is,
19. cause they're the [wealthy ones (TSK)],
20.➔ Lenore: [* tried to explain to] Cathy that, [PRI = 5]

... (H) .. life had changed now.

Table 2 provides the distribution of stressed I according to PRI. Tokens with zero-PRI (or no potentially interfering referents) constitute 30% of the data, while tokens with one potentially interfering referent comprise 39%, tokens with two-PRI 19% and with higher PRI scores the remaining 12%. If stressed I were to meet this operationalization of “contrastive”, we would expect to see a higher rate of stress associated with a higher PRI score. This is not the case, however: there is no predictable change in the rate of stress as the number of intervening referents increases (given on the left half of the table). Nor is there a correlation between the rate of stress and the binary distinction between absence and presence of any interfering referent (given on the right half of the table), which is the crucial distinction, according to Sun and Givón (1985: 341): we find near identical rates of stress in the absence (0 PRI) and presence of PRI (> 0) (18% and 19% respectively).

Table 2: Stressed I according to PRI (Potential Referential Interference) in the 10 preceding Intonation Units (N = 470; rate of stress = 19%)

<table>
<thead>
<tr>
<th>PRI</th>
<th>% stress (N): degrees of PRI</th>
<th>% stress (N): absence vs. presence of PRI</th>
<th>% data</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>18% (25/140)</td>
<td>18% (25/140)</td>
<td>30%</td>
</tr>
<tr>
<td>1</td>
<td>18% (34/184)</td>
<td></td>
<td>39%</td>
</tr>
<tr>
<td>2</td>
<td>16% (14/88)</td>
<td></td>
<td>19%</td>
</tr>
<tr>
<td>3</td>
<td>31% (12/39)</td>
<td>19% (63/330)</td>
<td>8%</td>
</tr>
<tr>
<td>4-5</td>
<td>16% (3/19)</td>
<td></td>
<td>4%</td>
</tr>
</tbody>
</table>

The lack of a correlation between PRI and realization of I corresponds with what has been found for 1sg subject expression in Spanish conversation (Travis and Torres Cacoullos 2012 (To appear)). PRI has, however, been found to affect the positioning of third person objects in Biblical Hebrew narratives (Sun and Givón 1985), and the realization of third person
referents—in different syntactic roles—in Pear Story narratives in Japanese (as unexpressed or nominal) and English (as pronominal or nominal) (Clancy 1980: 143).

A more striking difference across these studies is that the incidence of PRI varies greatly. For third person objects in narrative, Sun and Givón found a rate of approximately 15% (113/943 for the written and 48/320 for the spoken data) (1985: 343), and for third person referents in narrative, Clancy (1980: 201) found a rate more than double that, of 34% (558/1655) in English and 43% (401/925) in Japanese. For first person singular subjects in conversation, the rate is nearly double that again at approximately 70% in both English and Spanish (330/470 for English I here and 308/446 for Spanish yo, Travis and Torres Cacoullos 2012 (To appear)). Why the discrepancy?

One possible explanation is a genre difference, as it may be that monologic narratives, with greater topic continuity, have lower rates of PRI than interactive conversation, where topics change rapidly and frequently (cf., Travis 2007: 130) and where there are frequent references to discourse participants (i.e. first and second person), both of which may raise the rate of PRI. Another consideration may be grammatical person, as related to the notion of semantic compatibility: while first person may be compatible with all referential, human subjects, for third person, a distinction must be made between human and non-human referents, which may limit the pool of potentially interfering referents. But perhaps most important is the issue of subjects vs. objects, as objects are more constrained than subjects by the verb with which they occur (and are considered “internal” to the Verb Phrase in formalist models). Examples such as “knocking (on) the door”, “learning stuff”, “cut the boneless part” from Sun and Givón (1985) are all cases where a relatively limited set of referents could fill the object slot compared with what could fill the subject slot. Thus, the occurrence of PRI is sensitive to genre (lower in narrative than conversation), grammatical person (lower for third than first) and syntactic role (lower for objects than subjects). It is interesting to note that the rate of PRI for conflated syntactic roles reported in Clancy (1980) lies in between those of objects reported in Sun and Givón (1985) and subjects reported here and in Travis and Torres Cacoullos (2012 (To appear)), as we would predict given such sensitivities of PRI.

Another issue with PRI as an operationalization of contrast is that not all referents may be of equal value: some may be more important in the discourse (with importance/topicuality measured, for example, in Referential Distance and Topic Persistence (Givón 1983b; Myhill and Xing 1996: 348-351)), while others may be more peripheral (cf. Chafe 1994: 88-91). Particularly relevant for conversational data is how PRI should apply to discourse participants: does a non-coreferential first or second person reference (i.e. self or other reference to a discourse participant) “potentially interfere” in the same way that references to non-discourse participants do? We will see below (Section 3.3) that preceding non-coreferential uses of I affect the patterning of stress, but this does not have to do with PRI.

3.2 Double contrast

The notion of “double contrast” was originally proposed, though not operationalized, by Chafe (1976: 35), and a very similar concept has been independently applied to work on Spanish subject expression (e.g., Cameron 1992: 88-94; Mayol 2010: 2499; Silva-Corvalán 2003: 853). A quantitative implementation of “double contrast” is found in Myhill and Xing (1996: 314), who set out to test the role it plays in object position in Chinese narratives. According to their operationalization of “double contrast”, “in contrastive pairs there are two or more elements which are different in two clauses (either verbs with opposite meanings or nonverbal elements in a set relationship)” (Myhill and Xing 1996: 314).

Applying this operationalization here, we classify as manifestations of “double contrast” pairs of clauses that differ in two ways: in order for I to be contrastive, one difference must be in the subjects, and the second in the predicates, which must be related but in some sense
converse, e.g., negated (believe / not believe), doing vs. not doing (take along / leave behind), opposite direction (take / give), and so on. Furthermore, for Myhill and Xing (1996: 319), the two clauses must be no more than six clauses apart, as that was the maximum that occurred in their data, although for most of the examples given in their paper, the “contrastive” clauses are no more than three clauses apart. Here we apply the same measure of the 10 IUs that we applied in testing PRI, and follow Myhill and Xing to include the preceding and following 10 IUs (see Footnote 9). Given that in these data at least, the measure of 10 IUs corresponds to three or fewer clauses, this can be considered a stricter measure than that of Myhill and Xing, but it nevertheless is broader than that of Silva-Corvalán (2003: 853) and Cameron (1992: 86) who look just at consecutive clauses. The following two examples illustrate our application of this operationalization. In (4), ‘one of the guys’ ‘sliding across on his head’ is contrasted with ‘I’ and ‘couldn’t do that’, and in (5), ‘he’ (referring to Pete) ‘was my fashion consultant’ is contrasted with ‘I’ (referring to Harold) ‘wasn’t’. And note that in both cases, the target I (indicated with the arrow) is stressed.

(4)  
Alina:  
(H) The male athletes were incredible,  
but one of the guys,  
his entrance,  
on- --  
... <@ onto the stage @> is he,  
(H) comes sliding across on his head.  
... (H) And ~Hector,  
of course,  
looks over at me and goes,  
@@  
⇒  
.. I* couldn’t do that ~Lina,  
.. (H) otherwise I’d have no hair left.  
@@@  
(06 Cuz: 204-216)

(5)  
Miles:  
... He was my fashion consultant today.  
Pete:  
Right.  
... @@@  
Miles:  
Hm.  
Pete:  
@(H)  
⇒  
Harold:  
... I* wasn’t?  
(02 Lambada: 185-190)

In examples (4) and (5), the target clause is the second clause in the “contrastive” pair, as was the case for the majority of our contrastive tokens (15/19), which is precisely where it has been noted that the effects of double contrast are most commonly observed. Myhill and Xing, for example, find that the marked OV word order in Hebrew occurs proportionally more in the second clause of a contrastive pair than in the first (1996: 325), and Silva-Corvalán reports that, for Spanish subject expression, it is the subject of the second clause which is obligatorily expressed (2003: 853). Although token numbers are low, this general pattern is upheld in our data: the rate of stress when the target clause is the second of a contrastive pair is 40% (6/15), and when it is the first it is 1/4.\(^\text{11}\)

\(^{11}\) The one example of the latter is in the construction I don’t know, which independently shows a high rate of stress (see Section 4.5).
Table 3 gives the results for stressed I according to double contrast in the coded data. As can be seen, the rate of stress in contexts where double contrast is present is twice that as when it is not (37% vs. 18%), suggesting a correlation between stress and “double contrast”.

Table 3: Stressed I according to “double contrast” in the 10 preceding or following Intonation Units (N = 470; rate of stress = 19%)

<table>
<thead>
<tr>
<th></th>
<th>% stress (N)</th>
<th>% data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double contrast</td>
<td>37% (7/19)</td>
<td>4%</td>
</tr>
<tr>
<td>No double contrast</td>
<td>18% (81/451)</td>
<td>96%</td>
</tr>
</tbody>
</table>

Notwithstanding the occurrence of some apparently clear-cut examples such as (4) and (5), problematic is the fact that “double contrast” includes tokens that do not intuitively seem to be contrastive, while at the same time excluding some that do appear to be contrastive (a point also made by Myhill and Xing, 1996: 305). Example (6) below is a case of the former: Miles’ *I guess* and Harold’s *I don’t know* have distinct subjects and converse predicates, through negation of semantically related verbs, and thus meet the operationalization of contrast. It is unclear, however, whether Harold is trying to contrast his opinion with that of Miles’, or whether in fact *I don’t know* is used to mitigate Harold’s rejection of Miles’ idea of becoming a priest.

(6)

Miles: .. *So I guess* it’s time for me to become a priest.
Pete: .. @
Miles: It’s too dangerous out [there].
Harold: [<X Oh X>,

⇒ *I* don’t] know.
((3 IUs by another speaker intervening))
You have to be Catholic first.

(02 Lambada: 767-775)

Example (7) is one case which could be considered to be contrastive, in that Lynne is refuting Lenore’s assertion, but while the predicates are converse, the subjects are coreferential, and therefore non-contrastive, according to the operationalization.

(7)

Lenore: .. *So you have* your own equipment,
but,
Lynne: .. *(TSK) (H) No.*

⇒ *I* don’t have my own equipment at all.

(01 Actual Blacksmithing: 51-54)

But the main limitation of “double contrast” is that the number of tokens that meet this operational definition is just 19, accounting for only 4% of all tokens of I and 8% (7/88) of all tokens of stressed I. It is interesting to note that while Myhill and Xing (1996) observed a notably higher incidence of double contrast than that observed here (approximately one quarter of both the Hebrew and Mandarin preverbal objects in their narrative data met the operationalization), another study of first-person singular subjects, this time in Spanish, also found it to be highly infrequent (Travis and Torres Cacoullas 2012 (To appear)) found that just 4% (6/162) of first singular subjects, and 6% (5/81) of all expressed first singular

---

12 Our recalculations are 31/116 for Hebrew and 12/50 for Mandarin, based on Myhill and Xing (1996: 324-325, Tables 1 and 2 and 329, Table 7).
subjects, met Myhill and Xing’s (1996) operationalization of double contrast. Thus “double contrast” applies to such a small proportion of first singular pronouns that it fails to offer a general account.

### 3.3 Contrast in interaction

As an exploration of the potential manifestation of contrast in conversation, we follow the interactional approach applied by Travis and Torres Cacoullos (2012 (To appear)) to Spanish subject pronouns, taking into account the speaker’s role in relation to their interlocutor. An interactional contrastive function has been ascribed to stressed I in the discourse formulas I think and I believe by Dehé and Wichmann (2010: 18) who propose that “If … the accent is on the pronoun …, the focus is on the speaker’s opinion and may involve a contrast to his/her interlocutor’s attitude” (cf. also Silva-Corvalán 2001: 166, for a similar proposal regarding expressed subjects in Spanish). Here we operationalize this notion by considering the juxtaposition of speaker and interlocutor self-reference, as measured by the grammatical person and coreferentiality of the subject of the immediately preceding clause. If stressed I is contrastive in an interactional sense, we would expect a higher rate of stress when self-references to the speaker and interlocutor are juxtaposed (that is, with a preceding non-coreferential 1sg subject) than when the preceding subject is in third person. The results for this distribution are given in Table 4.

Table 4: Rate of stress on I according to subject of immediately preceding clause (N = 1,516, rate of stress = 15%)\(^{13}\)

<table>
<thead>
<tr>
<th>Subject of preceding clause</th>
<th>% stress (N)</th>
<th>% data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-coref I</td>
<td>23% (14/61)</td>
<td>4%</td>
</tr>
<tr>
<td>Non-coref 3rd person</td>
<td>18% (137/755)</td>
<td>50%</td>
</tr>
<tr>
<td>Coref you</td>
<td>15% (14/94)</td>
<td>6%</td>
</tr>
<tr>
<td>Non-coref you</td>
<td>14% (6/42)</td>
<td>3%</td>
</tr>
<tr>
<td>Coref I</td>
<td>10% (59/564)</td>
<td>37%</td>
</tr>
</tbody>
</table>

The environment that most favors stressed I, though again infrequent (accounting for just 4% of the data) is indeed that where the preceding subject was a non-coreferential I (as in line 4 in example (8) below), and the rate of stress here (23%) is twice that found in coreferential contexts (as in line 5 in example (8)), the environment that least favors stress (10%). Thus, speakers are more likely to stress I when they make a self-reference in response to another speaker’s self reference. This may suggest that stress on I has an interactional function, though not necessarily one of expressing difference of opinion.

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\(^{13}\) Excluding all tokens of I guess and I mean (N = 245) which are (near-) categorically unstressed, and tokens where either the target subject or the subject of the immediately preceding clause occur in quoted speech.  

\(^{14}\) Included here are 3rd person referential and non-referential, singular and plural, and 1st person plural as all pattern similarly in terms of the effect on stress on I in a subsequent clause.
However, when we consider the environment of a preceding third person non-coreferential subject, we find a rate of stress of 18%, which, though the direction is as predicted, is not significantly lower than that of a non-coreferential first person subject \((p = 0.3922\) in a chi^2 test). Nor does it differ significantly from the environment of a preceding second person, whether coreferential as in (7), or non-coreferential, as for the token in line 2 in (8), which show near identical patterning of 15% and 14% respectively.

Furthermore, there is a strong correlation between the juxtaposition of self-reference and turn-position: 75% (46/61) of the tokens that occur in the context of a preceding non-coreferential I occur in turn-initial position, as in line 4 in (8) above\(^{15}\), as opposed to just 28% of the data overall (see Table 5 below). And, as we shall see (Section 4.3), turn-initial position favors stressed I, suggesting that, rather than an effect for speaker-interlocutor juxtaposition, it is the initiation of a speaker turn which is associated with stressed I, which itself may be an interactional manifestation of contrast.

### 3.4 A balance sheet of tests for contrast

Of the three operationalizations of contrast we have applied to stressed I, we find no correlation between stress and PRI, and the apparent correlation with interlocutor self-reference is attributable to the disproportionate occurrence of this context in turn-initial position. We do find a correlation with “double contrast”, but this covers such a small proportion of the data that it fails to offer a general account.

Other quantifications of “contrast” as a unitary overarching phenomenon appear to yield similarly low counts. For example, building on Bentivoglio’s (1987: 46-48) examination of morphologically marked “contrast” or “emphasis” with Spanish 1sg subject pronouns, we examined the rate of stress on I with contrastive conjunctions, such as but and focus particles also, even, just, only and still (N = 34). We found that the rate of stress on I when it co-occurred with such items was indeed higher than the overall rate (29% vs. 19% respectively). However, such tokens again account for an exceedingly small proportion of the data, just 7% (34/470). This mirrors Bentivoglio’s result, in which the subject pronoun rate was higher for such contrastive tokens than in the absence of such markers, but these contexts accounted for only 4% of her data (36/892).\(^ {16}\)

Even when the criteria for “contrast” are broadened it still covers just a proportion of the data. Paredes Silva (1993: 41-43) in investigating what she calls “emphasis” with first singular subjects in Brazilian Portuguese letters included “contrast”—verbs with opposite meanings, negative versus affirmative, and different complements for the same verb, among several criteria—and “reinforcement”—expressions such as ‘at least’, ‘really’. She too found

\[19\] Doesn’t work in this household: 110-114

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\(^{15}\) See Section 4.3 below for our definition of turn-initial vs. non-initial position.

\(^{16}\) Travis and Torres Cacoullos (2012 (To appear)) found similarly low occurrences of the conjunction pero ‘but’ in Spanish conversation (3%, 29/912); but distinct from Bentivoglio (1987), they found no difference in the rate of 1sg subject expression yo in clauses conjoined with pero ‘but’ (52%, 15/29), with y ‘and’ (46%, 28/61) and in main clauses without a conjunction (49%, 400/822).
that the subject pronoun rate was nearly double in such emphatic contexts, but again only 12% (204/1,650) of all first singular subjects and 30% of those that were expressed (113/379) met the definition of “emphasis”.

“Contrast” as a general notion in subject pronoun realization, then, leaves us with the overwhelming majority of the data unaccounted for. Moreover, we have seen that “contrast” can be manifested in disparate ways, as a more semantic notion in the sense of “double contrast” or in a more interactional sense of speaker-interlocutor juxtaposition. Rather than continuing the quest to delimit contrast as a unitary concept that will by itself capture the function of stress on I and the attempt to directly code tokens as contrastive, we can acknowledge variation and profitably consider the joint effect of discourse features that are congruous with contrast and other co-occurring elements that may constrain speaker’s choice of stressed I. To do this, we adopt the variationist method, relying on evidence in the linguistic context of each token to operationalize hypotheses about variant choice as factors for multivariate analysis (cf. Labov 1966; Sankoff 1988b).

4 Linguistic conditioning of variable stress on I: discourse features contributing to stress

Linguistic variability is structured, conditioned by elements of the linguistic and extralinguistic context, which contribute to speaker choice among variant forms which have similar functions, here, stressed and unstressed first-person singular subjects, in broad terms, functioning to index the speaker. The variationist method yields the linguistic conditioning of variant selection in the form of probabilistic statements about the co-occurrence of variant expressions and elements of the linguistic context in which they appear (Labov 1969; Sankoff 1988a). We use a kind of multivariate analysis known as Variable-rule analysis (Sankoff 1988b), the goal of which is to account for the variation in the data by identifying a statistically significant subset of the factor groups operationalizing hypotheses about the function(s) of stressed I. The particular function(s) ascribed to variant forms, or the lack thereof, are thus quantitatively ascertainable in their linguistic conditioning (Poplack and Malvar 2007: 137-143; Poplack and Tagliamonte 2001: 88-94; Silva-Corvalán 2001: 133-138).

Table 5 depicts a multivariate model of contextual effects on speakers’ choice of stressed subject pronoun I. Shown in the first column are the probabilities, or factor weights: factors with a Probability closer to 1 can be said to favor, and those with a Probability closer to 0 to disfavor, speakers’ selection of stressed I. These results indicate that stressed I is favored

Two collocations in which the absence of stress on I is (near-) categorical are I guess (0/41) and I mean (1/210). Both thus fall outside the envelope of variation, and have been excluded from the multivariate analysis in Table 5 but are discussed further in relation to formulaic expressions in Section 4.5. The one example of stressed I in I mean is:

Lynne: (H) And like in some of em?
... (TSK) blood will spurt out,
you know,
➔
and I* mean,
oh.
(H) It's @nothing @ --
<@SM (H) it's the grossest thing SM@>. (01 Actual Blacksmithing 525-531)

Table 5 shows a Variable-rule analysis using Goldvarb Lion (Sankoff et al. 2012). Variable-rule analysis uses logistic regression to perform binomial multivariate analysis for a choice of the “1” variant (here, stressed I) vs. the “0” variant (unstressed I). The procedure determines the factor groups (predictor or independent variables) that together
when the previous coreferential I occurred at a distance of three or more clauses and when it was realized as stressed, in a turn-initial Intonation Unit, and by negative polarity, but it is disfavored by formulaic expressions.\textsuperscript{19} Semantic class of the verb, on the other hand, does not make a significant contribution. Subsequent columns show, for each factor (linguistic sub-context), the rate of stressed I, the number of tokens, and the percentage of the data that these tokens constitute. We will now go on to discuss each of these constraints.

Table 5: Variable-rule analysis of the contribution of factors selected as significant to the choice of stressed I in conversational American English (Santa Barbara Corpus of Spoken American English (SBCSAE))\textsuperscript{20}

<table>
<thead>
<tr>
<th>N = 1,610; Input: .11* (Overall rate: 15%)</th>
<th>Prob</th>
<th>% I stress</th>
<th>N</th>
<th>% data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Distance from previous mention as subject</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3+ intervening clauses</td>
<td>.60</td>
<td>22%</td>
<td>617</td>
<td>41%</td>
</tr>
<tr>
<td>0-2 intervening clauses</td>
<td>.43</td>
<td>11%</td>
<td>884</td>
<td>59%</td>
</tr>
<tr>
<td><strong>Realization of previous coreferential 1sg subject</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stressed I</td>
<td>.70</td>
<td>22%</td>
<td>86</td>
<td>12%</td>
</tr>
<tr>
<td>Unstressed I</td>
<td>.47</td>
<td>10%</td>
<td>637</td>
<td>88%</td>
</tr>
<tr>
<td><strong>Turn position</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turn-initial Intonation Unit</td>
<td>.56</td>
<td>21%</td>
<td>443</td>
<td>28%</td>
</tr>
<tr>
<td>Non-turn-initial Intonation Unit</td>
<td>.48</td>
<td>13%</td>
<td>1159</td>
<td>72%</td>
</tr>
<tr>
<td><strong>Polarity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>.68</td>
<td>26%</td>
<td>291</td>
<td>18%</td>
</tr>
<tr>
<td>Affirmative</td>
<td>.46</td>
<td>13%</td>
<td>1319</td>
<td>82%</td>
</tr>
<tr>
<td><strong>Status of verb</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clausal</td>
<td>.53</td>
<td>16%</td>
<td>1395</td>
<td>87%</td>
</tr>
<tr>
<td>Formulaic (Discourse Marker or Quotative)</td>
<td>.29</td>
<td>8%</td>
<td>201</td>
<td>13%</td>
</tr>
<tr>
<td>Semantic class of verb</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive, perception, desiderative</td>
<td>[.50]</td>
<td>17%</td>
<td>639</td>
<td>40%</td>
</tr>
<tr>
<td>Other</td>
<td>[.50]</td>
<td>14%</td>
<td>951</td>
<td>60%</td>
</tr>
</tbody>
</table>

Non-significant factor groups (Probabilities given in square brackets): Semantic class of verb.\textsuperscript{21}

In Table 5 factor groups are ordered thematically, according to the presentation that follows. Ordering the factor groups in terms of the significance of the change in log likelihood, from the first step of the “step down” procedure when the least important group gets “cut”, ranks Status of the verb, Polarity, Distance and Previous Realization as equally important (p = .000-.001) but Turn Position as less so (p = .041). Two other indications of relative importance of factor groups is their order of addition and the range between the factor weights, both of which put Turn Position last.

Results in Table 5 are based on those tokens (excluding I mean and I guess, N = 251) with three-way (N = 1,314) or two-way (N = 296) rater agreement on the status of stress on I (see Section 2.2). In separate analysis of only the tokens with three-way agreement, the same factor groups are significant and with the same direction of effect as in the pooled data shown in Table 5. In analysis of only the tokens with two-way agreement, not selected are Distance and Turn position, but while Distance maintains the direction of effect, Turn position (the weakest effect, as noted in note 19), does not.

Factor weights for the non-significant Semantic class factor group are from the first “step down” run, in which all groups are included in the regression.
* The relationship between the Input (corrected mean) and the overall rate of variant selection (which generally it closely reflects) appears distorted because Realization of previous coreferential 1sg subject applies to only 45% (723/1,610) of the data.

** Applies to coreferential subjects that occur at a distance of up to five intervening clauses.

4.1 Distance from the previous coreferential I: a measure of accessibility

While stress has been viewed pragmatically as encoding a contrast, from a more cognitive perspective it has been said to reflect a referent’s accessibility. For example, Hirschberg and Pierrehumbert (1986: 141) note that “speakers typically deaccent given information and accent new information”. But how might information status apply to the first person, which, as a discourse participant, presumably represents inherently given information?

In Givón’s (1983b) cross-linguistic topic continuity/accessibility hierarchy, it is proposed that the most continuous or accessible participants—those that have been mentioned recently—receive less linguistic coding, and the most discontinuous or least accessible participants—those that are newly introduced or reintroduced to the discourse—receive more coding. This is captured by Givón when he observes that “the more disruptive, surprising, discontinuous, or hard to process a topic is, the more coding material must be assigned to it” (1983b: 18), and Levinson (1987: 384) who notes, conversely, that “the more ‘minimal’ the form, the stronger the preference for a coreferential reading” (cf. also Ariel 1988: 79).

Subject continuity / accessibility can be more or less local. More locally, what may count is the subject of the immediately preceding clause, that is, whether the preceding clause subject was coreferential or not. Less locally, what may matter is distance, that is, how much discourse has passed since since the last mention of the coreferential subject. If accessibility works locally, based on coreferentiality in adjacent clauses, we would expect a first person subject coreferential with the subject of the preceding clause, as in (9), to be realized less often with a stressed I and a non-coreferential, or switch reference I, as in (10), to be realized more often with a stressed I. Such an effect is widely found in reports on variable subject pronoun expression in so-called null subject or pro-drop languages (see Silva-Corvalán 2001:154-169, for a review of studies of Spanish). On the other hand, if the purview of accessibility goes beyond the preceding clause, we would see an effect for less “accessible” or less “continuous” referents when the previous mention was at some distance, measured in the number of intervening clauses. Examples (10) and (11) are both non-coreferential, but (10) exhibits local switch reference, with only one intervening clause, while (11) exhibits further distance (three clauses) intervening. Accessibility in terms of distance has received much less attention in the literature than the switch reference effect. How do these two accessibility measures apply to subject pronoun stress?

(9) 0 intervening clauses (coreferential)

   Joanne: (H) that’s what I’d do,  
   ➔ I’d pick it up the night before.  

(15 Deadly Diseases: 1742-1744)

Distance was counted from previous mention as a subject, as referents occurring as subjects tend to be more “topical” than those occurring in other syntactic roles (Givón 1983b: 22). Further, subjects are the great bulk of first singular mentions: based on counts in the SBCSAE using the concordance program Monoconc (Barlow 2004), 82% (9,036/11,042) of all first person singular mentions are the subject pronoun I (counts for other forms are me = 1021, my = 954 and mine = 31).
We find that for subject pronoun stress what counts is distance, not local switch reference. Table 6 below shows a breakdown of the rate of stress by the number of intervening clauses. Note that there is no switch reference effect here, with there being no significant difference between zero (coreferential) and one intervening clause (switch reference) ($p = 0.58$). Though we do see a rise from one to two intervening clauses (and from there an apparently steady increasing rate of stressed $I$), the difference between one and two clauses is again not significant ($p = 0.2816$). Indeed, the best split across the different degrees of distance is between 0-2 and 3+. For this reason, we applied this split in the multivariate analysis depicted in Table 5, and configured the Distance factor group such that instances of the variable in which the previous coreferential $I$ occurred at a distance of zero, one, or two intervening clauses are opposed to instances in which the previous coreferential $I$ was three or more clauses away. With this split, we do observe a distance effect in the predicted direction, with stress on $I$ most favored at the larger degree of distance with a Probability of .60, as opposed to .43 at the lower degree of distance.

Table 6: Rate of stress on $I$ according to distance in clauses from previous mention (N = 1,501)\(^{24}\)

<table>
<thead>
<tr>
<th>Intervening clauses</th>
<th>% stress (N)</th>
<th>% data</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (Coreferential)</td>
<td>11% (59/564)</td>
<td>38%</td>
</tr>
<tr>
<td>1 (Local switch reference)</td>
<td>9% (17/184)</td>
<td>12%</td>
</tr>
<tr>
<td>2</td>
<td>13% (18/136)</td>
<td>9%</td>
</tr>
<tr>
<td>3</td>
<td>18% (17/96)</td>
<td>6%</td>
</tr>
<tr>
<td>4-5</td>
<td>21% (20/94)</td>
<td>6%</td>
</tr>
<tr>
<td>6+</td>
<td>23% (98/427)</td>
<td>28%</td>
</tr>
</tbody>
</table>

An alternative measure of accessibility to the number of intervening clauses is the number of intervening human subjects between coreferential mentions. Travis and Torres Cacoullous

\(^{23}\) The analysis in Table 5 has a lower log likelihood (-638.742) than one in which the Distance factors are 0-1 vs. 2+ clauses (-640.712) ($p < .05$) and one in which the Distance factors are 0 vs. 1+ (-643.474), which indicates that the split of 0-2 vs. 3+ provides a better fit of the model to the data (Guy 1993: 246-247).

\(^{24}\) Excluded from this count are cases where the number of clauses between coreferential mentions was not identifiable due to unclear speech intervening (N = 24) and tokens produced in quoted speech (N = 85). Counted as clauses were all finite verbs, regardless of formulaic status (Section 4.5).
(2012 (To appear)) applied such a measure to Spanish subject pronoun expression, and found that not only does it have a significant effect, it provides a better account of subject expression than measures of switch reference and distance in terms of the number of intervening clauses. Examples (10) and (11) serve to compare distance measured in terms of intervening clauses and intervening human subjects. In (10), the two coincide: there is one intervening clause, and one intervening human subject (*he*). In (11), on the other hand, there are three intervening clauses, but no intervening human subjects (two of the clauses have *it* as their subject, and the third has a *you* coreferential with the target *I*).

Contexts in which there is one intervening clause have an intervening human subject just slightly more than half the time (60%, 110/183), and this might be conjectured to explain the lack of a local switch reference effect. Nevertheless, when we consider intervening human subjects, we still fail to obtain a local switch reference effect: the rate of stressed *I* in cases of one intervening human subject (13%, 32/239), is not significantly higher than in cases of zero intervening human subjects (11%, 86/776), though it is now in the right direction. Thus, we can confirm our conclusion that it is distance from the previous coreferential mention, not local switch reference, which correlates with stress on *I*.

The distance effect observed here accords with Chafe’s suggestion that the pronoun *I* may be treated as “accessible”\(^{25}\) and therefore stressed, when speakers “bring the idea of themselves back into the active consciousness of the listeners” (1994: 87). Here, then, we have established an operationalization of this notion as a distance of three or more clauses from the previous mention.

### 4.2 Realization of previous coreferential *I*: local priming

Highly favoring stressed *I* in the multivariate analysis (with a Probability of .70) is previous realization as a stressed *I*. This is a priming effect, whereby the use of a certain structure in one utterance functions as a prime on a subsequent utterance, such that that same structure is repeated. Priming, or perseveration, has been characterized as “mechanical” rather than “functional” (Labov 1994: 547-568), being defined by Bock and Griffin (2000: 177) as “the unintentional and pragmatically unmotivated tendency to repeat the general syntactic pattern of an utterance”. Priming at a low degree of distance—a context that otherwise disfavors stressed *I*, as discussed above—is illustrated in line 6 in (12).

(12)
1. Mary: ... (TSK) (H) She was probably lonely when she was doing it,
2. you know that?
3. ... She probably was.
4. ... [X] --
5. Alice: *[I]* sat up with her,
6. Æ and *I* was talking to her,
7. she was doing all the decorating,

(07 A Tree’s Life: 328-334)

Priming, as far as we know, is found in just about every study that tests for it (cf. Bock 1986; Labov 1994: 547-568; Poplack 1980; Scherre and Naro 1991; Weiner and Labov 1983, inter alia), including studies on Spanish subject expression in different varieties (Cameron and

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\(^{25}\) For Chafe (1994: 74), the distinction between given and new information has to do with the speaker’s assessment of the status of consciousness of a referent in the mind of the hearer/addressee. Calling this information flow property “activation state”, he posits that when given information is moved to an intermediate activation state it is semi-active or “accessible” (Chafe 1987, 1994).
Flores-Ferrán 2003; Torres Cacoullos and Travis 2010a, 2010b). The question then becomes the coverage of this effect: how much of the data does it apply to, and how close to the target \( I \) does the previous mention have to be for priming to be observed?

Laboratory-based research has found that the effects of lexical priming are very short-lived, such that intervening items between the prime and target greatly weaken the priming effect (Joordens and Besner 1992; Meyer et al. 1972, inter alia). While the life span of structural priming remains under debate, there is some evidence that it can be maintained for up to 10 intervening sentences for some constructions (Bock and Griffin 2000). Based on corpus studies, both Szmrécsey (2006: 202) and Gries (2007) report that the priming effect is stronger in spoken than written data, a finding that mirrors what has been found in written and spoken sentence-completion tasks in psycholinguistic research (Branigan et al. 2000).

Across spoken genres, Szmrécsey (2006) found the priming effect to be stronger in less formal data, but more short-lived. Certainly genre itself plays a role in the duration of priming, as Travis (2007: 121) showed for Spanish first singular subject expression, finding that a significant priming effect was maintained at a distance of zero or one clause in interactive conversational data but at distances of up to five clauses in more monologic narratives, which exhibited greater subject continuity.

As shown in Table 7, at a distance of zero clauses, the rate of stressed \( I \) is 23% when the previous mention was realized with stress but 6% when the previous realization was unstressed (\( p = 0.0003 \)). Thus, priming of stressed \( I \) by a previously stressed \( I \) is strong in coreferential contexts. At a distance of one clause we still find a tendency toward a higher rate of stressed \( I \) in contexts where the previous coreferential mention was also stressed than when it was not (\( p = 0.11 \), but the \( N \) is low). At distances of two or more clauses from the previous coreferential \( I \), the priming effect has disappeared, with virtually identical rates of stress in both environments. Priming, therefore, has limited coverage, both in terms of its duration (it applies up to at most one intervening clause), and its pertinence (previous realization as stressed is an infrequent environment, given the low rate of stressed \( I \) overall).

<table>
<thead>
<tr>
<th>Previous realization</th>
<th>Stressed</th>
<th>Unstressed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% ( I^* )</td>
<td>( N )</td>
</tr>
<tr>
<td>0 (Coreferential)</td>
<td>23%</td>
<td>48</td>
</tr>
<tr>
<td>1 (Local switch reference)</td>
<td>25%</td>
<td>12</td>
</tr>
<tr>
<td>2 + intervening cl.</td>
<td>19%</td>
<td>26</td>
</tr>
</tbody>
</table>

Nevertheless, at low degrees of distance, the effect of previous realization is strong, and this confounds the distance effect: while, in accordance with the received generalization from an accessibility account, overall, the non-reduced form (stressed \( I \)) occurs proportionally more at greater than at lesser distances as we saw in the previous section, we observe that \( I \) is stressed as often at greater distances (22% with 3+ intervening clauses, in Table 5) as it is in

\[26\] This undoubtedly weakens the strength (see Note 19) of the priming effect seen in Table 5, where we included previous mentions occurring at a distance of up to five intervening clauses. Dissipation with increasing distance from the previous coreferential \( I \) confirms that the priming effect here is in speakers' production of stressed \( I \), and not in the raters' perception of stress, since in coding for the perception of stress the raters listened just to the IUs in which the tokens occurred, or with minimal surrounding IUs, consecutively, regardless of the distance between them (see Section 2.2 on the coding procedure).
coreferential contexts when the preceding subject was a stressed I (22% with 0 intervening clauses in the Stressed I column in Table 7). This coreferential priming effect yields a local pattern of clusters of “coreferential stressed I+stressed I” across consecutive clauses.

4.3 Turn position: an interactional role for stressed I

For the factor group Position in turn we considered where in a speaker’s turn the 1sg subject occurred, using Intonation Units. Tokens that occurred in a turn-initial IU (regardless of where in the IU they occurred) were coded as turn initial, including I in line 5 in (12), which occurs as the first word in the IU, as well as the first token of I in (10), which occurs following the discourse marker well.27 We find in the multivariate analysis that turn-initial position favors (.56), while non-turn-initial position slightly disfavors, stressed I (.48).

The favoring of stressed I in turn-initial position holds as long as the previous realization is unstressed—when the previous coreferential I is unstressed the rate of stress is 15%, 19/127 turn initially but 8%, 42/509 non-turn-initially. When the previous realization is stressed, turn-initial position no longer favors stress over non-turn-initial position ((at 19%, 3/16, vs. 23%, 16/70 respectively). That is, priming nullifies the turn-position effect, just as it confounds the distance effect.

The turn-position effect is at least in part independent of the degree of distance from the previous coreferential mention. Not surprisingly, a greater proportion of turn-initial than non-initial instances have the previous coreferential I at a distance of three or more intervening clauses (nearly double, at 63%, 268/425 for turn-initial vs. 32%, 346/1,071, for non-initial I), an environment which favors stress, as we saw above. Nevertheless, the tendency toward higher stress in turn-initial position is maintained at distances of two or fewer clauses.28

An independent turn-position effect can be interpreted as having to do with turn taking, and this may be a manifestation of a contrastive function of stress on I in an interactional sense. This is supported by the fact that the highest rate of stressed I in turn-initial position is when the subject of the preceding clause—belonging to (the end of) the interlocutor’s turn—is a non-coreferential first singular subject, at 26% (12/46), which is also the more likely context for the juxtaposition of interlocutor self-reference (see Section 3.3).

4.4 Polarity: stress in denials

As seen in Table 5, negation favors stressed I with a Probability of .68. This effect is maintained across individual verb types (listed in Table 8 below, with the exception of think), and regardless of negative construction, whether with never (stressed I rate 28%, 5/18) or with not/n’t in combination with do (26%, 39/150), did (30%, 10/33), am/’m (21%, 5/24) or can (24%, 4/17). Indeed, cross tabulations confirm that the polarity effect is independent of the other factor groups as well. At first blush, the negation effect may seem compatible with an interactional contrastive function, whereby stressed I would involve a contrast of the speaker’s point of view with respect to their interlocutor’s (Déhé and Wichmann 2010: 18).

27 Also coded as turn-initial were cases where the token occurs in the second IU, but where the first IU is made up of non-substantial material, such as a minimal response, as in (6) (oh, I don’t know) and (7) (no. I don’t have …) or a discourse marker with continuing intonation, marked by a comma, as in (8) (Okay, I retract …) and in (14) (well, I don’t know).

28 At distances of three or more intervening clauses, the rate of stressed I is 24%, 65/268, in turn initial and 20%, 69/346, in non-initial position; at distances of two or fewer, the corresponding rates are 15%, 23/157, and 10%, 71/725. Neither difference is significant in chi^2 tests, but the tendency in both distance contexts is the same.
However, the distribution patterns of negation do not support a function of contrast vis-à-vis the interlocutor. An interactional sense of contrast would suggest different patterning depending on where in the speaker’s turn the form occurs, specifically whether or not it occurs in a turn-initial Intonation Unit. We find, first, that instances of negated I are not disproportionately in a turn-initial as opposed to non-initial Intonation Unit (31%, 90/291 of negatives and 27%, 353/1,311 of affirmatives occur in a turn-initial Intonation Unit, \( p = .17 \)). Nor is turn-initial I significantly more likely to be negated than non-initial I (20%, 90/443 of turn-initial and 17%, 201/1,159 of non-initial occurrences are negatives, \( p = .17 \)). In addition, if negated stressed I had a interactional function it would be reasonable to expect a greater rate of stress on negated I in turn-initial than non-initial position, but the polarity effect is weaker turn-initially: in turn-initial position, there is no significant difference in the rate of stress between negatives and affirmatives (28%, 25/90 vs. 19%, 66/353 respectively, not quite statistically significant, \( p = .08 \)), but there is a significant difference in non-initial position (25%, 50/201 vs. 11%, 103/958 respectively, \( p < 0.0001 \)).

In fact, rather than being used to negate something that was previously uttered or is presupposed, as was claimed in the early literature on negation (cf., Givón 1979: 104; Horn 1985: 143), in conversational English most of the time (67%, \( N = 427 \)) negative clauses have been reported to be denials of “something which has not been explicitly asserted” (Tottie 1991: 21, 35).\(^{29}\) Thompson (1998: 325) observes that, unlike interrogative clauses, negative clauses do not participate in adjacency pairs and concludes that, though negatives are mostly denials, “what they deny is typically not explicitly present in the conversation”.

We can thus say that in general, speakers are more likely to stress I in denials than in affirmations.\(^{30}\) A possible interpretation is that the negation effect is related to contrast in a semantic rather than interactional sense, having more to do with the content of what is said in a fairly narrow context than with the positioning of interlocutors. This would accord with a view of negation as a “contrastive semantic element” alongside such items as ‘even’ and ‘really’ (e.g., Sun and Givón 1985: 346) (Myhill and Xing 1996: 342 also list ‘not’ as an “emphatic word”). Of the 19 tokens of double contrast identified (Section 3.2), 8 involved negation (as in examples (4) – (7) given above), notably higher than the overall proportion of negative contexts in the corpus of 18% (seen in the last column for “negative polarity” in Table 5).

The most frequent verb to be negated in the data is know, comprising close to one-third of the negated tokens (93/291). Of these, a full 90% (84/93) represent the expression I don’t know (that is, tokens of know in the present tense, negated with no and without a co-occurring modal), which presents a relatively high rate of stressed I at 27% (23/84). This rate is no higher than the rate for other negated tokens (i.e. excluding this construction; 24%, 48/198), but it is more than twice as high as the rate of stress with affirmative I know (12%, 6/51). In Section 4.6 we propose that I don’t know should be considered a lexically particular construction.

### 4.5 Formulaic vs. clausal status of the verb

Analysis of distributions according to verb type shows that the data is highly skewed in this regard, with just 11 verb types making up over one half of all singular tokens, and the remaining half being made up of a further 240 distinct types, as indicated in Table 8. Indeed, just three verbs (mean, think and know) make up close to one third of the data. Table 8 lists

\(^{29}\) Denials of something just uttered constitute 14% (63/427) of negatives (Tottie 1991: 35, Table 3.3).

\(^{30}\) Stress is unlikely in interrogatives, in which the rate of stress is a mere 6% (3/48) (the rare case of stressed I in an interrogative can be seen in (5)).
the most frequent verb types in descending order of rate of stressed I, and as can be seen, these highly frequent verbs exhibit very different rates of stress. At the bottom of the list are mean, the most frequent verb, constituting 11% (210/1,861) of the tokens rated for stress, and guess, the least frequent of these 11 verbs, constituting 2% (41/1,861) of the data. These two verbs have been excluded from the multivariate analysis due to their (near-) categorical lack of stress, but their behavior raises the question of formulaic expressions.

Table 8: Rate of stressed I of the 11 most frequent verbs to occur in the corpus (N=1,861)

<table>
<thead>
<tr>
<th>Verb</th>
<th>% stressed I</th>
<th>N</th>
<th>% data</th>
</tr>
</thead>
<tbody>
<tr>
<td>do</td>
<td>27%</td>
<td>51</td>
<td>3%</td>
</tr>
<tr>
<td>know</td>
<td>23%</td>
<td>153</td>
<td>8%</td>
</tr>
<tr>
<td>be*</td>
<td>22%</td>
<td>130</td>
<td>7%</td>
</tr>
<tr>
<td>go</td>
<td>17%</td>
<td>63</td>
<td>3%</td>
</tr>
<tr>
<td>think</td>
<td>13%</td>
<td>189</td>
<td>10%</td>
</tr>
<tr>
<td>have (possessive)</td>
<td>13%</td>
<td>61</td>
<td>3%</td>
</tr>
<tr>
<td>see</td>
<td>10%</td>
<td>50</td>
<td>3%</td>
</tr>
<tr>
<td>get</td>
<td>7%</td>
<td>55</td>
<td>3%</td>
</tr>
<tr>
<td>say</td>
<td>6%</td>
<td>67</td>
<td>4%</td>
</tr>
<tr>
<td>mean</td>
<td>0%</td>
<td>210</td>
<td>11%</td>
</tr>
<tr>
<td>guess</td>
<td>0%</td>
<td>41</td>
<td>2%</td>
</tr>
<tr>
<td>Other (240 types)</td>
<td>13%</td>
<td>794</td>
<td>43%</td>
</tr>
<tr>
<td>Average</td>
<td>13%</td>
<td>1,861</td>
<td></td>
</tr>
</tbody>
</table>

* Various be constructions, not including be like, be sure

In order to explore the effects of formulaicity, we singled out high frequency I + verb collocations which have been characterized independently as formulaic based on patterns of complementizer that, such as I mean, I guess, I think, I remember and I'm sure (Tagliamonte and Smith 2005: 299; Thompson and Mulac 1991: 244; Torres Cacoullos and Walker 2009: 21), or phonetic reduction, in the case of I don’t know (Scheibman 2000: 120). Each of these collocations (i.e. with no variation in tense, polarity or presence of a modal) represents a high proportion of the uses of the corresponding verb. I mean accounts for all tokens of mean with the first singular subject (210/210), including just six tokens as a relative clause (e.g., You know what I mean). Similarly, I guess represents all tokens of I + guess (41/41). I’m sure constitutes 81% (13/16) of I + be sure; I don’t know 69% (84/153) of I + know; I remember 67% (14/21) of I + remember; and I think 59% (111/189) of I + think. Finally, a highly frequent collocation is I know, which makes up 33% (51/153) of I + know (and 85% (51/60) of affirmative I + know), and thus we include it as another construction with the potential to be used in a formulaic way.

How can more propositional, or “clausal”, instances of these seven collocations (I think, I don’t know, I know, I remember, I’m sure, I guess and I mean) be distinguished from less propositional, or more formulaic “discourse-marker” instances? Due to the indeterminacy of the status of a collocation in any one specific instance as “formulaic” (cf., Thompson 2002), we relied on position in the clause and in the Intonation Unit to determine their status.

In terms of position in the clause, we coded as discourse markers cases of these collocations as parentheticals, that is, when they appear between the subject and verb or

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31 Other collocations that have been classified as formulaic in the literature based on these same criteria occur so infrequently in these data that we do not include them in the discussion, namely I + find (N=2), I + hope (N=9), I + wish (N=5). We note that no tokens of these collocations in our data occur in what we have defined discourse-marker contexts, that is, either parenthetically or on their own in an Intonation Unit.
following the verb, as in (13). In terms of position in an Intonation Unit, we coded as
discourse markers tokens that were produced prosodically independently from other clausal
material (for discussion of the prosodic independence of discourse markers, see Redeker
considered to be prosodically independent those tokens that occurred strictly alone in their
own Intonation Unit, as for I don’t know in (14), or preceded by a conjunction (e.g. and I
mean, as in the example in footnote 17). Our strict criteria thus yield a conservative measure
of discourse marker status, but this is necessary in order to operationalize the notion of
formulaicity in a replicable way (see Thompson 2002 for a less conservative application of
the term, and correspondingly higher proportions of formulaic uses).

(13) Corinna: ... he’s gonna divorce her I think.  
(45 The classic hooker: 519)

(14) Pamela: Well,
I don't know,
I guess it must,  
(05 A book about death: 237-239)

The rate of use of these collocations as discourse markers ranges from 21% for I
remember (3/14) and 22% for I think (24/111), to 69% for I know (35/51). Overall, these
discourse marker uses are mostly prosodically independent instances; despite the great
attention it has received in the literature (e.g., Dehé and Wichmann 2010; Thompson 2002;
Traugott 1995), the “parenthetical” use of these forms was found to be rare, accounting for
3% (17/524) of all tokens of these collocations, and 8% (17/221) of tokens of the collocations
classified as discourse markers (as defined here).

Also classified as formulaic were quotatives with ask, be like, go, say, think introducing
quoted speech or internal thought, as in examples (15) to (17) below.

(15) Alina: I said,
<VOX oh,
you want a matching set VOX>?  
(06 Cuz: 1282-1284)

(16) Dana: And I was like what?  
(50 Just wanna hang: 531)

(17) Miles: And I'm thinking,
we'll,
... I guess that's her husband,  
(02 Lambada: 1313-1315)

We classified as clausal, on the other hand, all other subject+verb combinations, as well as
tokens of the collocations which elsewhere have formulaic uses (I think, I remember, etc.) that

\(^{32}\) But on the use of I think as a discourse marker occurring in the same IU as the material
which it can be considered to mark see Kärkkäinen (2007: Chapter 5) and Ono and
do not occur on their own in an IU, most commonly introducing a clause in the same IU, such as *I guess* in (17), and occasionally occurring with a nominal direct object, as in *I know* in (2).

As seen in Table 5 in the Status of verb factor group, formulaic expressions—discourse markers as operationalized here and quotatives—strongly disfavor stressed *I*, with the lowest Probability in the data set (.29). On the other hand, clausal instances, which are the majority, have a stressed *I* rate at the average (16%, Probability .52).33 This distinction can be seen clearly in the case of *I think*, for which the rate of stressed *I* is halved in its formulaic use, either as a discourse marker, as in (13), or as a quotative, as in (17), as opposed to its other, more clausal, occurrences (10%, 3/29, vs. 20%, 32/159, respectively). On the other hand, *I mean* and *I guess* are nearly categorically unstressed, regardless of whether they are strictly (as measured here) formulaic or not, which indicates that these are lexically particular constructions.

The strong disfavoring effect of formulaic expressions is in general agreement with results reported in Déhé and Wichman (2010). These formulaic expressions may be treated as prefabs, or prefabricated units (Bolinger 1976: 1), rather than as combinations of subject and verb. In usage-based theory, Bybee (2010: 34) proposes that the cognitive basis for linguistic units is “the chunking of sequential experiences that occurs with repetition”, and such “chunking” of frequent sequences of words can result in a loss of compositionality and analyzability (Bybee 2010, Ch. 3). This has been noted by Traugott (1995: 39) who proposes that, in *I think*, “the subject is losing referential (objective) properties, and becoming simply the starting-point of a perspective” (cf. also Déhé and Wichmann 2010: 5; Thompson 2002: 146). That is, in these formulas the *I* is not referential but has been absorbed into a chunk, and as such is less likely to be stressed. We underline that the disfavoring of stress here cannot be attributed to lack of speaker commitment (or some other motivation an analyst might attribute to a speaker), but is due to the formulaicity itself. Evidence is the behavior of *I don’t know* which presumably encodes a similar degree of epistemicity as *I think*, but which favors stress on *I*, as we now discuss.

### 4.6 Particular constructions: I don’t know, I would

Not significant in the multivariate analysis was semantic class. Verbs related to expressing speaker point of view (including cognitive (e.g., *figure, remember*), perception (*notice, see*) and desiderative (*like, want* verbs) do not favor stressed *I* in the aggregate, as we might expect if stress on *I* is a marker of speaker stance or encodes a contrast (as claimed for example in Déhé and Wichmann, 2010: 18). From Table 8 above, we verify that the frequent cognitive verbs do not behave uniformly as members of a class in terms of rate of stress: *know* has among the highest rates of stress, *think* is at the average, and *mean* and *guess* have the lowest rates. There is thus no evidence from patterns of stressed *I* for distinctive first person singular constructions based on classes of verbs.34 The disparate rates among the frequent verbs suggest that, rather than semantic classes of verbs behaving consistently with respect to stress on *I*, there are lexically-particular associations with stressed *I*.

More accurately, there are lexically particular configurations, or constructions, with tendencies for higher or lower rates of stressed *I*, as we saw in the preceding section on formulaic expressions. Constructions are form-function pairings, where function includes

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33 Among the clausal uses, stress on *I* is higher in a main clause (18%, 202/1154)—the most frequent context—than in a subordinate (8%, 11/139) (p = .0034), though not a relative clause (15%, 15/102).

34 Separate analysis of cognitive, perception and desiderative verbs (N=639) yields the same tendencies as in Table 5 (Turn position and Realization of previous coreferential 1sg subject are not significant, but still go in the same direction).
stored information about linguistic and extralinguistic contexts of use (for an overview, see Croft and Cruse 2004: 225-290; Goldberg 2006: 3-17). Consider, for example, the idiosyncratic behavior of *I don’t know*. While formulaic chunks with a non-referential *I* generally disfavor stress, this one particular construction in fact favors it, patterning like the general discourse-negative *I* construction. Setting this construction aside, the rate of stressed *I* in the discourse-marker and quotative formulas is halved, from 8% (16/201) to just 4% (4/110). The higher than average rate of stress in *I don’t know* (27% (23/84), deviating from the pattern of unstressed *I* in formulaic expressions, suits a construction-based view of grammar, where constructions range from the particular to the more schematic or general (Bybee 2010, Ch. 5).

We can think of *I* *don’t know* (CLAUSE) as a more schematic but still lexically particular construction, where *I* *don’t know* indicates that there is a strong favoring of stressed *I*, and the parentheses (CLAUSE) indicate that the construction has an open slot, that may be filled by a clause or left unfilled.\(^35\) We note that the higher than average rate of stress is observed both when *I don’t know* is formulaic (14) (19%, 8/43) and when it is more clausal (18) (37% 15/41). Nevertheless, the general disfavoring of stress in formulaic constructions is maintained here, with the rate of stress in the formulaic *I don’t know* almost half that in the clausal use (though the difference does not achieve significance, \(p = .0874\)).

(18) Miles: *I* *don’t know* why they did it that way.

\(02\) Lambada: 1036

The status of *I don’t know* as a particular construction is appreciable when we compare *I don’t think*. While *I don’t know* has more than double the rate of stressed *I* than affirmative forms of *know* (27%, 23/84 vs. 12%, 6/51), negated forms of *think* do not present a notably higher rate of stressed *I* than affirmative forms (23%, 5/22 vs. 18%, 30/167). Given the disparate behavior of these two negative polarity expressions, the *I* *don’t know* (CLAUSE) construction cannot be dismissed as simply a manifestation of the general favoring effect of negation. Thus, even though *I* *don’t know* (CLAUSE) is not autonomous from the general polarity pattern nor entirely immune to the effects of formulaicity, it stands out as particularly favoring stress on *I*.

Another schematic construction with idiosyncratic behavior with respect to stressed *I* is conditional *I* *would* (NEG) VERB. Conditional *would*, as in (19) below, shows a high rate of stressed *I* (54%, 15/28, including negated forms), in distinction from habitual *would*, which is close to the average rate of stress (13%, 6/45). This is undoubtedly related to its relatively low rate of contraction: not surprisingly stressed *I* is less likely in contracted than non-contracted forms of *be, have, will, would* (9%, 25/281 vs. 41%, 19/46), and conditional *would* is less likely than other auxiliaries-modals to contract (with 9 contracted to 16 non-contracted affirmative forms). However, rather than viewing the higher rate of stressed *I* in conditional *I would* as being directly attributable to less frequent contraction, in a construction-based view we can interpret these co-occurring patterns—disfavoring contraction and favoring stress on *I*—as part of a single conditional *would* construction, namely *I* *would* (NEG) VERB. Like *I* *don’t know* (CLAUSE), this particular construction displays a higher than average rate of stressed *I* beyond the predictions of the general constraints identified in the multivariate analysis.

\(^35\) 90% (76/84) of the tokens of *I don’t know* occur either on their own in an Intonation Unit (\(N = 43\)) or with a clause initiated in the same Intonation Unit (\(N = 33\)). Of the remaining eight, two occur with a nominal complement; four with a wh-complement (e.g. *I don’t know why*), and two as *I don’t really know*. 

27
Alina: 

.. I* would let him run editorial.
I* would let him do anything he wanted to do in editorial.

(H) They clipped his wings.
They wouldn't let him do anything.

5 Summary and conclusion

In this paper, we have examined stress on I from three perspectives: through an acoustic analysis, testing operationalizations of contrast, and in multivariate analysis. In so doing, we determined that the strongest acoustic cue for perceived stress on the first singular subject pronoun is duration. We further identified a number of discourse features associated with speakers’ choice of stressed I, based on co-occurrence patterns in conversational data. The patterns observed demonstrate support for some conjectures on the discourse functions of stress, but not for others.

In particular, we found little evidence of an overarching contrastive role for stress on I. None of the three previously implemented operationalizations of contrast that we studiously applied here (Potential Referential Interference, double contrast and juxtaposition of speaker and interlocutor self-reference) offer a meaningful account of stress on I. PRI simply does not affect rates of stress; double contrast may, but is highly infrequent; and juxtaposed speaker-interlocutor self-reference is a subset of a speaker-turn effect. In sum, coding tokens one by one directly for contrast as a unitary global concept proved a fruitless exercise.

In the multivariate analysis, however, significant is a negative polarity effect, whereby we see a higher rate of stress on I in denials, a measure of a contrastive function in a semantic sense. In addition, a speaker-turn effect, whereby stressed I is favored in a turn-initial Intonation Unit, can be interpreted as an interactional contrastive function related to the ways in which interlocutors exchange the floor. Part of this is the local pattern “non coreferential I+stressed I” across speaker turns, in which a higher than average rate of stressed I occurs when the speaker’s self-reference is juxtaposed to the interlocutor’s.

The multivariate analysis also provided evidence that, alongside these semantic and interactional contrastive functions, accessibility, an information flow property, is relevant to stress on I, based on distance between mentions (three or more clauses), and not switch reference in adjacent clauses. It is notable that this distance effect for stress found here differs from the switch reference effect found for variable subject pronoun expression cross-linguistically. Thus, the cross-linguistic equivalence between expression and stress (implied by Givón (1983b: 18), and stated explicitly by Payne (1997: 43)) does not quite hold. Accessibility apparently operates differently way in the realization of English I as stressed or unstressed from how it operates in the realization of subject pronouns as expressed or unexpressed in languages with variable subject expression.

Confounding the accessibility effect is the fact that coreferentiality interacts with priming: while, following the received generalization, the reduced form (unstressed I) is preferred in coreferential contexts when the preceding subject was unstressed, the non-reduced form (stressed I) is favored in coreferential contexts when the preceding subject was stressed. Thus besides the local interactional pattern of “non coreferential I+stressed I” across speaker turns, another local pattern, due to priming, is clusters of “coreferential stressed I+stressed I” across consecutive clauses. This result corresponds with a wide body of work that has found priming to play a role not just in subject expression, but in grammatical variation in general, though it had not previously been identified for stress.

A disfavoring environment for stress was found in a set of particularly highly frequent discourse formulas, including discourse markers (I think, I don’t know etc.) and quotatives.
The tendency for stressed *I* to be absent in these items is evidence that they behave as unanalyzable chunks: the *I* is not referential, and therefore less likely to be stressed. This is particularly evident in two discourse formulas, *I mean* and *I guess*, which are nearly categorically unstressed, as well as in *I think*, where *I* is stressed one half as often in its formulaic use as opposed to its more clausal use. One exception to this, however, is *I* *don’t know* (CLAUSE), which shows a significantly higher rate of stress, even compared with other cases of negation. Another lexically particular construction which also favors stress is *I* *would* (NOT) VERB. This is in accordance with a construction-based view of grammar, where lexically particular constructions can be identified which both contribute to and deviate from more general patterns.

In sum, we see a combination of general factors influencing speakers’ choice of stress on *I*, related to both accessibility and contrast, as well as local patterns due to mechanical priming effects and turn-taking, together with lexically particular constructions. Rather than ascribing speaker motivations on an example-by-example basis, we hope to have illustrated that “qualitative” interpretation is inseparable from quantitative linguistic analysis, through the operationalization and testing of hypotheses. We conclude that questions about the functions of linguistic forms can be empirically addressed by accounting for the variation in the data of spontaneous speech.
Appendix

Transcription Conventions (Du Bois et al. 1993)

. final intonation contour = lengthening
, continuing intonation contour [ ] speech overlap
? appeal intonation contour ! booster: emphatic speech
... medium pause (> 0.7 secs) X one syllable of unclear speech
.. short pause (about 0.5 secs) @ one syllable of laughter
-- truncated intonation contour <@ @> speech produced while laughing
- truncated word <SM SM> speech said in a smiley voice
(H) in-breath (( )) researcher’s comment
(Hx) out-breath <VOX VOX> speech produced with marked voice quality

References


