Grammar emerges through reuse and modification of prior utterances

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Abstract
Given the growing consensus that grammar emerges as language is used in social interaction, how grammar emerges through interaction still remains much unknown. This study demonstrates that the beginnings of the emergence of constructions can be found in individual interactions. Through an investigation on videotaped English conversations and corpora using discourse analysis, conversation analysis, and corpus linguistic methodologies, I find that conversational participants have a tendency as high as 80% or more to reuse words in prior turns. I argue that reuse as the mechanism of resonance motivation and modification as the mechanism of relevance motivation work competitively and conjointly, shaping the emergence of grammatical structures of a language. Reuses lead to formation of the fixed frame; modifications form the category for an open slot. In summary, grammar emerges through interaction among participants who are constantly reusing and modifying prior utterances to achieve current interactive goals.

Keywords
Conversation, discourse, Emergent Grammar, grammar, interactional linguistics, modification, repetition, reuse

Introduction
With the advent of Emergent Grammar (Hopper, 1987, 1998), Usage-based Theory (e.g. Bybee, 2009, 2010, 2013; Bybee and Beckner, 2010), and Interactional Linguistics (e.g. Couper-Kuhlen and Selting, 2001; Ochs et al., 1996; Thompson et al., 2015), there
is a growing consensus that grammar emerges as language is used in social interaction. However, how grammar emerges through interaction still remains largely unknown. In this article, building on Goodwin (2013) I take the position that grammar of a language emerges through reuse and modification of prior utterances. My study demonstrates that the beginnings of the emergence of constructions can be found in individual interactions.

There is a dialogic social dimension in the emergence of grammar (Hopper, 1998) and in syntax (Du Bois, 2014b). Linguistic anthropological research reveals that the organization of human action is co-operative and transformative (Goodwin, 2013). Goodwin observes that the subsequent speaker reuses with transformation existing resources to build a new action. Goodwin’s study not only provides groundbreaking insight into human action, but also carries an important implication for linguistic research. Goodwin notes that ‘building subsequent utterances through decomposition, reuse, and transformation of language structure provided by another is a central locus for grammar as a form of public, social practice’. Although Goodwin’s study does not focus on grammar, his insightful view has inspired the current study.

This article examines how grammar emerges through interaction. Using naturally occurring English data with discourse analysis, conversation analysis, and corpus methodologies, I first present quantitative evidence that conversational participants have a strikingly strong tendency to repeat the words in prior turns (see the ‘Pervasiveness of linguistic and gestural repetitions’). My study is among the first to provide a quantitative account of how pervasive repetitions of utterances and gestures are based on videotaped conversational data. I then study how speakers repeat: speakers reuse and modify prior utterances to achieve their current interactive goals (see ‘How do speakers repeat? Reuse and modify prior words for the current goal’). This raises a question as to whether there is another drive, besides resonance (Du Bois, 2014b), for speakers to constantly reuse and modify prior utterances. Therefore, I propose the relevance motivation. I extend the analysis to English corpora and argue that reuse as the mechanism of resonance motivation and modification as the mechanism of relevance motivation work competitively and conjointly, shaping the emergence of grammar (see ‘Reuse and modification shaping the emergence of grammar’).

**Background and data**

Emergent Grammar recognizes that grammar is ‘simply the name for certain categories of observed repetitions in discourse’ (Hopper, 1998: 156). ‘[The] fixed “structure” is actually a set of schemas, some more “entrenched” (Bybee, 1985, 1998; Langacker, 1987) than others, arising out of many repetitions in daily conversational interactions’ (Thompson and Hopper, 2001). High frequency, resulting from repetition, impacts speakers’ linguistic knowledge (Bybee, 2006). Previous studies have revealed many discourse functions of repetition. For example, repetition contributes to formulaicity (Tannen, 1987) and facilitates comprehension by providing semantically less dense discourse (Tannen, 1989:
49) and coherent topics (Tao, 2005), and promoting priming (Anderson, 2008). Modified repeats assert the primacy of the second speaker’s rights (Stivers, 2005). Repetitive reportings provide a rhetorical device for certain interactional goals (Wu, 2014). Gestural matching contributes to the co-production of an action (Lerner, 2002). Reproduction of gestures and actions can organize intersubjective engagement and sequential organization (Arnold, 2012).

Repetitions are pervasive in language use (e.g. Bennett-Kastor, 1978, 1986; Brenneis and Lein, 1977; Du Bois, 2014b; Goodwin, 1983; Goodwin and Goodwin, 1987; Johnstone, 1987; Keenan, 1977; Tannen, 1989; Tao, 2015). A present utterance is coupled to a prior one (Du Bois, 2014b). Repetition is more common in unplanned conversation (Ochs, 1979a). Speakers tend to reuse certain syntactic structures (Gries, 2005). Many pioneering studies have provided insight into the central role of repetition in language use. However, there is still little research to quantitatively demonstrate how common repetition occurs in everyday conversation. This study will use videotaped data to provide a quantitative analysis of how pervasive linguistic and gestural repetitions are.

Some previous studies explore the dialogic orientation of human interaction from the perspective of reported speech. Bakhtin (1981) recognizes that ‘the word in language is half someone else’s’ (p. 279). Voloshinov ([1929] 1986) and Goffman (1979) also notice the multiple voices in reported speech. Goodwin and Goodwin (1987) find that children frequently reuse with transformation the linguistic features of their peers’ speech. Goodwin (2007) shows how separate parties build meaning and action in concert with each other. Goodwin (2013) studies how human actions are built by decomposing, reusing, and transforming the different kinds of resources provided by predecessors. Linell (2009) provides a comprehensive account of the dialogism in communication. Du Bois’ (2014b) dialogic syntax argues that resonance between utterances is the fundamental organization of syntax. These studies represent a compelling advance.

Inspired by Du Bois’ (2014b) finding on resonance, I consider resonance to be a major motivation in language communication. The idea that speakers are trying to maximize resonance seems to conflict with the Maxim of Quantity (Grice, 1975) – the injunction to be informative with maximum efficiency (Du Bois, 2014b, in press). My study introduces another motivation – the relevance motivation, which competes with the resonance motivation to provide new information.

The data draw on videotaped face-to-face English conversations and corpora (see description in ‘Reuse and modification shaping the emergence of grammar’). The videos, produced by PBS, record two of the wealthiest people in the world, Bill Gates and Warren Buffett, being interviewed by college students in 2005 (Figure 1). The 20 questions were unknown to Gates and Buffett in advance. Three questions immediately repeated by Buffett constitute the three datasets.

The speech is transcribed using the Jefferson transcription system (Sacks et al., 1974: 731–733).1 A snapshot of the speaker may be placed above or next to his or her speech (underlined). In the two symbols following, the span of the box corresponds with the words under it:
Pervasiveness of linguistic and gestural repetitions

This section provides a quantitative account of how pervasive linguistic and gestural repetitions are in conversation.

Linguistic reuse

My data reveal that in face-to-face conversation, participants have a tendency as high as 80% or more to reuse the words in prior turns.

Using a 344,141-word corpus composed of 54 Mandarin conversations, Tao (2015) finds that the top 100 frequent words account for 78% of the running words. This shows that repetition of words is common within a relatively large collection of conversations. There are two possibilities: (1) repetition is common within each conversation, and (2) repetition is not common within each conversation but is common across different conversations. The question becomes whether repetition is common within a single conversation. This study will examine this question with three conversations, whose transcripts are treated as three independent corpora. The transcript of the entire 53-minute interview constitutes the fourth corpus. I used the type/token ratio (TTR) calculated by the corpus software AntConc 3.3.2. Token is the total number of words in a text; type is the number of unique words.

Dataset (1) has 63 types and 89 tokens. Although due to the small size the TTR is high (Baker, 2006:52) (72.3%), almost half of the words (43.8%) are repeated. Dataset (2) has 96 types and 188 tokens with a lower TTR (51.1%) and 68.6% repeated words. Dataset (3) has 90 types and 184 tokens with a TTR of 50.8% and 71.2% repeated words. The transcript of the entire interview has 1697 types and 10,204 tokens, with a TTR as low as 16.63%. The 20% (339) most frequent words repeated at least eight times account for

Figure 1. Gates and Buffett interviewed by students.
80.0% (8130) of the tokens. That is, more than 80% of the words are repetitions. These examinations show that repetition is common within a single conversation. The longer the conversation, the more the repetitions.

The following transcript provides a visualization of how prevalent repetitions of words in a single conversation are. The boxes that have the same shape indicate repetitions:

**Dataset (2) Wallet**

01 Student: How much money,
02 Buffett: (outstretched hands) you guys being both billionaires,
03 you guys carry in your wallets at any given time= (Audience: Hahaha)
04 Buffett: How much we've got in our wallets,
05 Well, I can (pointing) answer that.
06 Because we're gotta go to uh, this evening we're going to get in a poker game.
07 Student: Okay,
08 Buffett: And it's a five hundred dollar buy-in, uh.
09 Gates: So I made very sure that I have five five, at least five hundred dollars in my wallet.
10 Buffett: (hhhh)
11 Gates: ah, I have a little more than that,
12 Buffett: But I don't carry around a lot of money
13 Bill?
14 Gates: You know actually a lot of times, it's weird
15 I don't carry a wallet at all.
16 Buffett: I do, what I do carry is bridge problems,
17 Buffett: So [that if I get in a line or things are slow or even if I'm driving. Ah, [haha
18 Buffett: ((h)A~h~)
19 Gates: Hahahahaha
20 Buffett: He'd better have five hundred tonight though. (h)
21 Buffett: He’d better have five hundred tonight though. (h)
22 Gates: Yeah (h)
23 Buffett: Hahahahaha
24 Gates: In fact | brought a little extra. So uh, I’m I’m ready for the game. (h)

The following diaigraphs (Du Bois, 2007, 2014b) provide a visual illustration of some structural repetitions:
Linguistic repetitions on the morphosyntactic level do not necessarily involve reuse of prosodic patterns. Consider diagraph (3):

(3)

01 Student: How much money, you guys being both billionaires, in your wallets at any given time
04 Buffett: How much we've got in our wallets,

Buffett does not reuse the prosodic patterns in his repetition. The student’s utterance (line 1) is low in pitch – mostly lower than 178 Hz, whereas Buffett’s repetition (line 4) is high in pitch – mostly higher than 178 Hz (Figure 2).

Gestural reuse

Gestural reuse refers to the imitation of a prior or simultaneous bodily behavior such as gaze, facial expression, body posture, and hand gesture. A total of 63 snapshots were taken to capture all the major body movements of Gates and Buffett in the three datasets. My data show that gestural reuse is pervasive. Conversation participants are found to imitate each other’s gestures more than one-third of the time (38.1%).

Self-imitating. Throughout the interview, both Gates and Buffett prefer one particular gesture (Figures 3 and 4). Gates keeps it in 73.0% of the snapshots and Buffett in 31.7%. When they are not talking, they almost always maintain this gesture. Buffett puts his hands on the leg that is on the side of the interviewer; Gates puts his hands in between his legs.

Others-imitating. In all, 38.1% snapshots in which the two people have similar gestures are marked with hexagons (Figure 5(a)). The remaining 61.9% indicating different gestures are marked with rectangles (Figure 5(b)) – usually when one party is talking and the other is listening. There are two kinds of others-imitating.

1. Simultaneous others-imitating (Figure 6).

2. Sequential others-imitating (Figure 7).
Figure 2. Waveform and pitch contours.

Figure 3. Both prefer this gesture in datasets (1) and (2).

Figure 4. Both prefer this gesture in dataset (3).

Figure 5. (a) Hexagons indicate similar gestures and (b) rectangles indicate different gestures.

Figure 6. Examples of simultaneous others-imitating.
In dataset (2), Buffett reaches for his pocket while saying *in our wallets* (first image in Figure 7). During the process, Gates turns his gaze to Buffett’s hand. Moments later, when Gates reaches for his pocket, Buffett also gazes at Gates’ hand (second image in Figure 7). The two movements form a sequential gestural reuse.

One party’s movements can immediately trigger the other party to imitate the gesture, forming an immediate sequential gestural reuse (Figure 8).

Gates laughs (first image in Figure 8) when he says *if I’m driving*. He also lowers the pitch and volume of voice (Figure 9).

The pitch scope of *I’m driving* (108–150 Hz) is lower than its co-text (145–200 Hz). The stance (Goodwin, 2002; Günthner, 1999; Iwasaki and Yap, 2015) Gates is displaying...
Table 1. The students’ three questions and Buffett’s repetitions and additional actions.

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Speech</th>
<th>Additional action</th>
</tr>
</thead>
</table>
| (1) Worst investment  | **Student:** As a public what we hear most about are your successful investing in ventures or the new products that you developed that work out. I was just wondering what is, what would you consider to be the worst investment you’ve ever made? ↘(falling intonation)  
Buffett: The worst investment I ever made? ↘(rising) | Give a rhetorical question               |
| (2) Wallet            | **Student:** How much money, as you guys being both billionaires, you guys carry in your wallets at any given time? ↘Buffett: How much we’ve got in our wallet? ↘ | Comment on his own ability               |
| (3) Super power       | **Student:** Um, my question is if you could have one super power, what would it be and why? ↘Buffett: One super power? ↘Bill? He thinks more about that than I do. | Pass the question on to Gates Justify his request |

with a switch into a whisper voice can be categorized as confidential (Goffman, 1979). Such a ‘gossip’ effect coupled with Gates’ laughter effectively triggers (Goodwin, 1990; Jefferson, 1979) laughter from Buffett and the students.

**How do speakers repeat? Reuse and modify prior words for the current goal**

This section discusses how conversational participants repeat: speakers reuse and modify prior utterances to achieve the current goal.
Unlike in the other 17 cases, where Buffett immediately answers the interviewer’s question, there are three cases in which Buffett repeats parts of the question (Table 1).

Buffett does not repeat the whole question; rather, he selects certain aspects (Clark and Gerrig, 1990; Holt, 2000) and laminates new layers such as prosody (Goodwin, 2013; Günthner, 1999) that are relevant to his own goal. Buffett decomposes the students’ questions (with falling intonations) and layers rising intonations (Figure 10).

Buffett’s rising intonations are grammatically mandatory to turn his phrasal repetitions into questions in (1) and (3), but not (2). Buffett’s abandonment of an unmarked falling intonation and adoption of a marked rising intonation suggest that his rising intonations may carry a certain message – in this case, indicating surprise. In (1), after repeating with a rising intonation, Buffett gives a rhetorical question. Not addressing the student’s question indicates that Buffett may be treating it as problematic. In (2), because well signals contrast, the prior utterance How much we’ve got in our wallet must imply an attitude opposite to the accepting attitude in the following utterance I can answer that, which can possibly be an attitude of surprise. In (3), the surprise conveyed by the rising intonation is evident in Buffett’s subsequent action – turning the question to Gates. These examples demonstrate that prosodic means can be used to modify a repetition to suit the current speaker’s own goals.

**Figure 10.** Rising intonations of Buffett’s repetitions.

```
01 Student: Um, obviously, as a public= what we hear most about are
          Buffett Gates
          Buffett Gates
02 your successful investing
          Buffett Gates
03 in ventures or the new products that you developed that work out.
```

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Some other modifications can be illustrated in dataset (1) where a subsequent action is built by reusing with modifications the materials provided by a prior speaker:

**Dataset (1) Worst investment**

In his repetition, Buffett performs systematic modifications of the semiotic resources used in the student’s question (Table 2).

Using the Reuse and Modification Notation for repetition (Su, under review), the similarities and differences between the source speech and the repetition are illustrated in Table 3.

1. Linguistic semiotic resources

The lexical choices are partially identical. Buffett reuses only two phrases and changes the second-person pronoun into first-person pronoun. The syntactic structures are different. The student uses a full interrogative sentence, whereas Buffett only uses a noun phrase. The student uses the present perfect tense to emphasize the impact of Buffett’s past failures on his present life, whereas the simple past tense Buffett uses may convey the message that past failures do not impact his present life. The full syntactic structure and the long sentence the student uses indicate that failure is a serious and significant topic for her, whereas the segmentary phrasal unit Buffett uses indicates that failure is not a big deal. The prosodic features are different. The student uses a falling intonation, whereas Buffett uses a rising intonation (see analysis earlier in this section). The perspectives are different. In a self-repair, the student abandons an objective perspective what is in favor of a subjective one what would you consider to be. This indicates that the student focuses on one’s subjective perception of a failure. Buffett does not reuse consider; the lack of subjective perception implies that Buffett is not bothered by failure. The manners
Table 2. Modifications in Buffett’s repetition.

<table>
<thead>
<tr>
<th>Aspects</th>
<th>Source speech (student’s question)</th>
<th>Repetition (Buffett’s answer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic</td>
<td><em>Non-objective</em>: self-repair abandoning ‘what is’</td>
<td><em>Objective</em>: ‘I ever made’</td>
</tr>
<tr>
<td></td>
<td><em>Subjective</em>: ‘what would you consider to be’</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Interrogative sentence</em>: ‘what is, what would you consider to be the worst investment you’ve ever made?’</td>
<td><em>Noun phrase</em>: ‘The worst investment I ever made?’</td>
</tr>
<tr>
<td></td>
<td><em>Personal deictic shift</em>: ‘you’</td>
<td><em>Personal deictic shift</em>: ‘I’</td>
</tr>
<tr>
<td></td>
<td><em>Present perfect tense</em>: ‘you’ve ever made’</td>
<td><em>Simple past tense</em>: ‘I ever made’</td>
</tr>
<tr>
<td></td>
<td><em>Prosody</em>: falling intonation</td>
<td><em>Prosody</em>: rising intonation</td>
</tr>
<tr>
<td></td>
<td><em>Delivery</em>: articulate, earnest</td>
<td><em>Delivery</em>: quick, easy</td>
</tr>
<tr>
<td>Co-text</td>
<td><em>Pre-text</em>: ‘successful investing or new products’</td>
<td><em>Repetition</em>: ‘Worst investment I ever made?’</td>
</tr>
<tr>
<td><em>(parallel contrast)</em></td>
<td><em>I was just wondering</em></td>
<td><em>(Look down)</em></td>
</tr>
<tr>
<td></td>
<td><em>Source</em>: ‘Worst investment you’ve ever made?’</td>
<td><em>Post-text</em>: ‘How long do you have?’</td>
</tr>
<tr>
<td>Facial expression</td>
<td>‘ever made’.</td>
<td><em>Emotion</em>: excited</td>
</tr>
<tr>
<td></td>
<td>‘The………………………made’,</td>
<td><em>Emotion</em>: calm</td>
</tr>
<tr>
<td>Stance</td>
<td><strong>challenging, proud of herself</strong></td>
<td><strong>calm, teasing</strong></td>
</tr>
<tr>
<td></td>
<td>The student’s stance is not accepted by Buffett.</td>
<td>Buffett’s stance is accepted by the student as she bursts into laughter.</td>
</tr>
</tbody>
</table>
of delivery are also different. The student speaks in an articulate and earnest way, indicating that she thinks seriously about failure, whereas Buffett speaks in a quick and easy way, indicating that he is not bothered by past failures.

2. Facial expression

Instead of using *said* to introduce the reported speech, Buffett imitates the student’s facial expression (raising eyebrow) but expands the scope of his eyebrow raising to cover the whole quotation. The emotions associated with the facial expressions are different. The student’s facial expressions show that she is very excited and proud of herself for having been able to put such a challenging question to one of the most successful men in the world. In contrast, Buffett’s calm face indicates that the question does not constitute any challenge for him.

3. Stance

Speakers take up stances when they quote (Clift, 2006; Goodwin, 2007; Goodwin and Goodwin, 2004; Holt, 2000; Mayes, 1990; Sams, 2010). When the student says *as a public*, she enacts herself as a character (Goffman, 1979) representing the voice of the public (Clayman, 2007). The student then reports the impression Gates and Buffett give to the public (line 1–3). When the student proceeds to ask about their failures, she immediately shifts to another character (line 4). In such a move she enacts herself as a unique thinker who stands out from the rest of the public, an individual who is not bounded by public ideologies, but can think independently and critically and is able to formulate a challenging question to Gates and Buffett. Saying *I was just wondering* also distances (Gal, 1998: 322; Hayashi, 1997) herself from the responsibility of raising a negative question. The challenging stance in the student’s speech is further heightened by her facial expression. The raising of her eyebrows coupled with her proud look (see the pictures in Table 2) reveals her pride in being able to raise a challenging question to two worldwide famous public figures. The student’s stance is both challenging and proud of herself, whereas Buffett’s stance is both calm and teasing, indicating that he is not worried over failure. The student’s stance is not acknowledged by Buffett because Buffett does not answer the question in the way the student expects. The contrastive co-text structure (*successful* versus *worst*) the student uses is reused by Buffett. In saying *the worst investment I ever made? How long do you have?*, Buffett frames his repetition in a contrast between the two current participants presented: *I* (Buffett) and *you* (the student), implying that ‘the question is not too challenging for
me but too big for you’. Buffett’s stance is acknowledged by the student when she bursts into laughter (line 9).

To summarize, through a systematic modification of the prior utterance, Buffett is able to use the repetition to serve his own goal in this interaction. When he repeats with an additional rhetorical question, he is throwing the question back and not acknowledging the student’s position.

The finding that the speakers choose to reuse and transform only those aspects that are relevant to their own interactive goal is also supported in Figure 11.

Figure 11 illustrates how conversational participants reuse and modify others’ prior utterances to achieve current goals. From lines 6 to 12, Buffett gives an inadequate answer to the student’s question about how much money he carries in his wallet. Buffett says that he has a little more than five hundred dollars because tonight Gates and he are going to a poker game. Buffett then turns the question to Gates (line 13), with an inquisitive stance to find out whether Gates also has five hundred dollars for tonight. Gates does not answer Buffett’s question but switches to a different topic (lines 16–20) – carrying bridge problems. Gates becomes so fully engaged with this new topic that he even takes out bridge problems from his pocket. Gates’ new topic completely draws the audience’s attention, who together with Buffett join in Gates’ laughter (line 19). Seeing everyone’s attention being drawn to a different topic and his question being ‘ignored’,
Buffett wittily uses a repetition (line 21) to bring the topic back. Buffett’s repetition reuses the sentence structure of Gates’ utterance (line 20), subject (Gates) + verb (have) + object, and modifies the object from something mental to work on to five hundred tonight.

Through reuse and modification, Buffett is able to successfully bring Gates back to his question. The audience’s attention has also been brought back to this topic (i.e. five hundred dollars for the game). This is evident in line 23 where the audience bursts into laughter. Gates also accepts Buffett’s question this time and says yeah (line 22). Gates further shows his understanding and cooperation by saying I brought a little extra (line 24). This utterance resonates with Buffett’s words I have a little more than that (line 11) and forms a semantic alignment. Gates continues to show his alignment by saying I’m ready for the game (line 24), which ties back to Buffett’s word game (line 6). Both parties are now satisfied with the information supplied.

This section shows that conversational participants reuse with modification prior utterances to achieve current goals.

Reuse and modification shaping the emergence of grammar

Du Bois (2014a) argues that competition between differently motivated strategies is real for participants in the moment of language use. Motivations such as iconicity, economy, and aesthetics (Haiman, 2010: 148–149) shape the outcomes of language production. The previous section discusses how Buffett evades the questions by repeating them. Whatever his interactive goals are at various moments, resonance (Du Bois, 2014b) alone is not adequate to account for the participant’s trying to subvert the conversation to achieve a certain goal. This is why I am arguing that besides resonance motivation, there is another equally important motivation – relevance motivation. This section discusses my argument that reuse as the mechanism of resonance motivation and modification as the mechanism of relevance motivation work competitively and conjointly, shaping the emergence of grammatical structures.

Crucial to this idea is the understanding that grammar emerges locally through language use (e.g. Bybee, 2006, 2010; Hopper, 1998; Thompson and Hopper, 2001): ‘In many cases, the speaker has not decided what the utterance is to express prior to its onset. Rather, it is in the course of the utterance that the intended act and idea emerges’ (Ochs, 1979b; see also Goodwin, 1979).

According to Du Bois (2014b), resonance refers to the catalytic activation of affinities across utterances, which ‘exploits the full potential of the linguistic system to assign value to novel analogies between paired words and structures’. Du Bois notes that the identical framing of the juxtaposition (e.g. he’s still ___) sets up a frame that makes resonance possible. In doing so, the theoretical equation (e.g. healthy : walking around) is rendered overt by dialogic juxtaposition. Based on Du Bois’ notion, the resonance motivation can be defined as follows:
Other things being equal and under certain conditions, speakers will prefer to maximize affinities across utterances, by reusing locally available linguistic recourses produced in a prior turn.

The *relevance motivation* can be defined as follows:

Speakers are motivated to modify a prior utterance to make it suitable for their own situations and propositions.

The relevance motivation is different from Grice’s (1975) Maxim of Relevance, which emphasizes that participants assume each other to be relevant to the topic at hand. The relevance motivation stresses that speakers are driven to say things relevant to their own situations and goals.

The mechanism for resonance motivation is reuse; the mechanism for relevance motivation is modification. Example (3) illustrates these two motivations:

(3) *Meeting* (an extract from the interview)

```
1 Gates: I’m in meetings a lot.
... ... ...
30 Buffett: Uh no meetings.
31 Gates: ((laugh))
```

In answering the question about a typical work day, Gates says that he is *in meetings a lot* (line 1). After Gates finishes his long answer, it is Buffett’s turn to answer this question. Driven by the resonance motivation, Buffett reuses Gates’ word *meetings*. At the same time, driven by the relevance motivation, Buffett changes Gates’ *a lot* into a negation *no* to describe his own situation. In doing so, Buffett enacts himself as a character comparable to Gates but different from Gates. Gates’ laughter (line 31) upon hearing Buffett’s words indicates that he has picked up the message that Buffett implies. This example shows that the resonance and relevance motivations can function on utterances even across multiple lines.

Resonance and relevance motivations can function not only with shift in speakership, but also under same speakership. Consider example (4) from the interview:

(4)

```
46 Gates: he’s more of a business type thinker,
47 I’m more of a technology type thinker.
```

Gates reuses his own sentence structure *somebody be more of an X type thinker* to maximize the resonance between two juxtaposed utterances, while modifying *business* into *technology* to make it relevant to the situation he is describing.

Compared to *business type thinker, technology type thinker* is rarely used. An exact search on Google.com on 8 December 2011 yielded 37 results for *business type thinker* but zero for *technology type thinker* other than the two by Gates in this interview. Based on a database as large as Google, we might conclude that these two might be among the
The earliest documented uses of technology type thinker: The creation of this new expression is made possible through the mechanisms of reuse and modification. Framing of the juxtaposition (more of an X type thinker) primes (Du Bois, 2014b) the use of technology type thinker. Another precise search on 21 June 2015 yielded ‘about 30 results’4 for business type thinker and seven for technology type thinker. A following search on 1 November 2015 yielded ‘about 43 results’ for business type thinker and ‘about 13 results’ for technology type thinker. The use of both phrases increases over time. Although all the technology type thinker instances are still from this interview, the frequency of its documented use has increased more than five times in about four years, due to republishing of this interview transcript on other websites. We can further predict that if this expression starts to accumulate more frequency, it will become a part of one’s language knowledge (e.g. the role of frequency in grammaticalization in Bybee, 2006 and Sohn, 2010).

To examine English speakers’ knowledge of the construction X type thinker, I investigated several large-scale contemporary English corpora (Table 4).

The corpora with data before 2007 have zero tokens of X type thinker. The corpora with data up to 2012 or 2015 start to capture some early uses. The infrequent (Table 4) yet highly contextualized (Table 5) uses of the X type thinker sequence indicate that this is a new construction currently emerging through discourse.

Expressions or syntactic patterns coined by influential public figures can acquire widespread use through media exposure. Recurring reuses and modifications can accelerate the process for such expressions or patterns to become a part of speakers’ language knowledge. In the case of X type thinker, 3 of the 38 occurrences are regarding the former US President George W. Bush’s words: one is the original version in an interview (BUSH: Well, I think he’s become more zero-sum type thinker); one is a direct reported speech (George W. Bush On Putin, his former fishing partner: ‘Well, I think he’s become more zero-sum type thinker’); the other one is an indirect reported speech (Vladimir Putin has become more of a ‘zero-sum type thinker’). An exact search of zero-sum type thinker on Google.com on 23 June 2015 yielded 1460 results, the vast majority (1230) being reports of Bush’s comments about Putin. It is predicted that as more and more people encounter this expression, the expression itself and the construction X type thinker will become more entrenched in speakers’ knowledge of the English language.

The emergence of X type thinker as a construction is observed with a wide range of categories at the X slot, including proper nouns (e.g. Sam Reinhart type thinker), adjectives (e.g. a visionary type thinker), sentences (e.g. ‘I’m already right’ type thinker), and even non-linguistic sequences (e.g. an A → Z type thinker). This indicates a wide range of possible modifications that users can make when they reuse the X type thinker pattern. Among the 38 occurrences, the most frequent (16/38, 42.1%) instance is ‘outside of the box type thinker’, suggesting that as a certain kind of modification acquires more frequencies over the other kinds of modification, a new idiomatic expression emerges.

In summary, what constitutes linguistic capacity is largely the knowledge of a sizable collection of lexicalized constructions (Pawley and Syder, 1983). X type thinker can become a lexicalized construction if its use reaches a considerable frequency. The mechanisms of reuse and modification are critical for a pattern like this to accumulate sizable frequency. Reuses and the resonance motivation lead to formation of the fixed frame of a grammatical construction, whereas modification and the relevance motivation make possible the formation of the schematic category – lexical candidates that are legitimate for the open slot.5
Table 4. Frequency of use in major contemporary English corpora (21 June 2015).

<table>
<thead>
<tr>
<th>Corpus</th>
<th>Medium</th>
<th>Size</th>
<th>Time</th>
<th>‘Business type thinker’</th>
<th>‘Technology type thinker’</th>
<th>‘Type thinker’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web as Corpus</td>
<td>Web</td>
<td>n/a</td>
<td>Up to present</td>
<td>0</td>
<td>0</td>
<td>38</td>
</tr>
<tr>
<td>Corpus of Contemporary American English</td>
<td>Web</td>
<td>450 million</td>
<td>1990–2012</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Google Books</td>
<td>Written</td>
<td>155 billion</td>
<td>Up to present</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>British Academic Written English Corpus</td>
<td>Written</td>
<td>6.5 million</td>
<td>2005–2007</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Anthology Reference Corpus</td>
<td>Written</td>
<td>10,921 papers</td>
<td>Up to 2007</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>British National Corpus</td>
<td>Written and spoken</td>
<td>100 million</td>
<td>1980s–1993</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>British Academic Spoken English Corpus</td>
<td>Spoken</td>
<td>1.6 million</td>
<td>The turn of 21st century</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SwitchBoard</td>
<td>Conversation</td>
<td>0.5 million</td>
<td>Before 1992</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*WebCorp. Research and Development Unit for English Studies, Birmingham City University (http://www.webcorp.org.uk/live/).

*Coca is ‘perhaps the only corpus of English that is suitable for looking at current, ongoing changes in the language’ (Davies, 2010; http://corpus.byu.edu/coca/).

*http://googlebooks.byu.edu/x.asp


*ARC (https://the.sketchengine.co.uk/open/).

*BYU-BNC (http://corpus.byu.edu/bnc/, Brigham Young University).

Conclusion: Grammar emerges through reuse and modification of prior utterances

Through an empirical investigation on videotaped English conversation and corpora, I have shown that the beginnings of the emergence of constructions can be found in individual interactions. But in order for a construction to form, it must occur over many uses. I have demonstrated that conversational participants have a strikingly strong tendency to reuse utterances (more than 80%) and gestures (more than one-third of the time), provided by themselves and others. Speakers perform transformative operations that incorporate prior linguistic and embodied structures to serve current interactive goals. I have argued that grammatical structure arises where equally plausible motivations such as resonance motivation and relevance motivation are competing and cooperating for an utterance on the same linguistic dimension. Reuse as the mechanism of resonance motivation and modification as the mechanism of relevance motivation work competitively and conjointly, shaping the emergence of grammatical structure. Highly frequent reuses lead to the formation of the fixed frame of a grammatical construction, and various modifications at a certain position form the category for an open slot in a grammatical construction. In conclusion, I argue that grammar emerges through human interaction in which participants are constantly reusing and modifying prior utterances to serve current interactive goals.

This study carries implications on understanding the role repetition plays in shaping grammar. In functional approaches to grammar, the centrality of repetition in discourse has been widely recognized (e.g. Bybee, 1996, 2006; Bybee and Scheibman, 1999; Du Bois, 1985, 2014b; Givón, 1979; Haiman, 1997; Halliday, 1978: 4; Hopper, 1987, 1998;
Langacker, 2000: 32; Tannen, 1989). ‘Grammar is best understood as what has been ritualized from interactions’ (Thompson and Couper-Kuhlen, 2005). What this study adds to the existing research is the finding that repetition creates grammar through the mechanisms of reuse and modification and as a result of the competing and cooperating resonance and relevance motivations. This finding extends our understandings of how grammar emerges through interaction.

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Notes

1. Tilde: rapid speech
   Colon: lengthening
   Degree sign: low in volume
   Equals sign: latching
   Period: falling intonation
   Comma: falling-rising intonation
   Bold italics: emphasis (modified by Charles Goodwin)
   Bracket: overlaps or speech co-occurring with body movements (a change made in this article)
   Numbers in parentheses: silences in seconds and tenths of seconds
   Double parentheses: body language
   (h): a noticeable outbreath

4. Quote from Google.com search result page.
5. There is also evidence from research on child language acquisition (e.g. Bannard and Lieven, 2009; Brown, 1998).
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Su D (under review) A multimodal approach to repetition in conversation and its implications.


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Danjie Su is a PhD candidate at the University of California, Los Angeles (UCLA). Her research areas are discourse and grammar, Mandarin grammar, and Chinese as a second language. Her current projects are on the functions of major Chinese grammatical constructions in conversational discourse and the use of authentic materials in second language teaching.