On the multimodality of English [ADV *and* ADV] construction: A collostructional approach

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In the study of multimodal constructions, it remains an important methodological issue that the entrenchment of multimodal constructions depends not only on the frequency with which certain gestures co-occur with particular verbal constructions, but also on how salient and typical the gestures are for the constructions (Hoffmann 2017). As several researchers have proposed applying collostructional analysis to address this issue (e.g., Hoffmann 2017; Schoonjans 2017; Zima 2017), this study employs such analysis to the actual investigation of multimodal constructions. What makes this analysis possible is the notion of the *gesture lexicon* (Kipp 2004), where its lexical entries, or *gesture lemmas* are "taken as prototypes of recurring gesture patterns where certain formational features remain constant over instances" (Kipp et al. 2007: 4). With reference to previous studies on *recurrent gestures* (Ladewig 2014), a total of 62 gesture lemmas were identified in this study, and some of them showed significantly high collostruction strength to the constructions investigated. Thus, the results provide compelling evidence that multimodal constructions are entrenched in our mind.

Collected from the TED Corpus Search Engine, an online corpus system that searches transcripts of over 4,800 TED Talks (Hasebe 2015), the data used in this study form a multimodal corpus with 407 speakers performing 1,092 gestures in total. Following Kipp's NOVACO scheme (Kipp 2004), all gestures were coded in ELAN and assigned gesture lemmas. The construction under investigation is English [ADV *and* ADV] construction, instances of which compose the reduplicative adverbial constructions (*over and over* [N = 160], *again and again* [N = 107], and *on and on* [N = 48]) and the oppositive adverbial constructions (*back and forth* [N = 110], *up and down* [N = 92], and *in and out* [N = 59]). They form a constructional network (Figure 1) through formal or semantic analogy.

Regarding the reduplicative adverbial constructions, each construction exhibits a similar tendency that the gesture lemma PROGRESS (Figure 2) has the highest collostruction strength. Of even greater interest is the fact that the reduplicative adverbial constructions as a whole show much higher collostuctional strength to the gesture lemma (Table 1), indicating that language users have lexically schematic multimodal constructions. Conversely, the oppositive adverbial constructions display different dispositions, each of which favors particular gesture lemmas. Moreover, Table 2 demonstrates that the oppositive adverbial constructions holistically exhibit high collostruction strength to the repetitive gestures that involve opposite movements regardless of the directions (Figures 3–6). This finding raises the possibility of multimodal constructions that are both lexically and kinesically schematic in nature.

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Tables & Figures

Table 1. Gesture lemmas attracted to RACs

Cogestures (N = 294)	Expected Frequency	Frequency in the corpus	P Fisher exact (Intermodality Strength)
ATTRACTED			
I.Progress (107)	39.58	147	1.86E-36
I.Wiping-Window (15)	5.65	21	2.22E-05
Beat (81)	60.04	223	5.14E-04
I.Clockwork (4)	1.35	5	2.04E-02

Table 2. Gesture lemmas attracted to OACs

Cogestures (N = 238)	Expected Frequency	Frequency in the corpus	P Fisher exact (Intermodality Strength)
ATTRACTED			
I.To-Fro (45)	12.42	57	3.18E-21
I.Up-Down (35)	9.37	43	2.40E-17
I.Small-To-Fro, 2H (38)	12.21	56	3.17E-14
I.Small-Up-Down (17)	4.14	19	3.96E-10
I.Small-To-Fro, 1H (16)	4.79	22	3.53E-07
I.In-Out (8)	2.4	11	4.09E-04

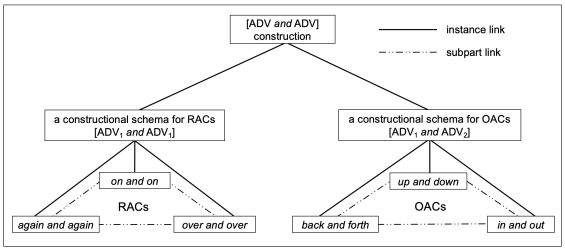
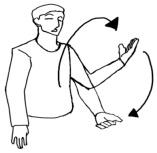


Figure 1. The constructional network

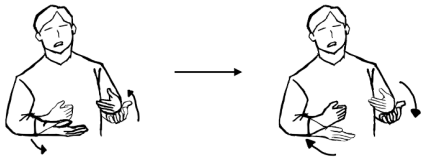


Description	Hand moves in circles where in the upper arc the hand moves away from the body.
Features	Move: circular movement/parallel to the sagittal plane
Frequency	OVER: 55 (37.2%), AGAIN: 37 (34.9%), ON: 15 (37.5%) BF: 4 (3.8%), UD: 1 (1.2%), IO: 1 (2.0%) other constructions: 34 (6.1%)

Figure 2. PROGRESS

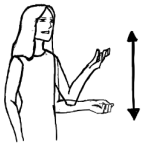
Description	Hand moves to one side, and then the other (and repeats the movement several times). If this gesture occurs with both hands, they move in the same direction.
Features	HS: open/forefinger, Loc: →side → other side Move: movement from the elbow
Frequency	OVER: 1 (0.7%) BF: 29 (27.4%), UD: 5 (6.0%), IO: 11 (22.4%) other constructions: 11 (2.0%)

Figure 3. TO-FRO



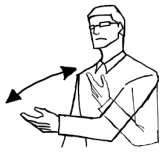
Description	Both hands alternate quickly in a back and forth movement.
Features	2H, HS: open/forefinger, Loc: in front of torso Move: movement from the wrist
Frequency	OVER: 5 (3.3%), AGAIN: 1 (0.9%), ON: 1 (2.5%) BF: 26 (24.5%), UD: 2 (2.4%), IO: 10 (20.8%) other constructions: 11 (2.0%)

Figure 4. SMALL-TO-FRO, 2H



Description	Hand moves in an up-down movement. If this gesture occurs with both hands, they move in the same direction.
Features	Orient: PD/PU, Move: straight up-down motion (from the elbow)
Frequency	OVER: 2 (1.4%), AGAIN: 1 (0.9%) BF: 2 (1.9%), UD: 31 (37.3%), IO: 2 (4.1%) other constructions: 5 (0.9%)

Figure 5. UP-DOWN



Description	Hand moves away from the body and then back toward the body, or in the opposite direction.
Features	HS: open/forefinger, Move: AB → TB/TB → AB
Frequency	AGAIN: 2 (1.9%) BF: 5 (4.7%), UD: 1 (1.2%), IO: 2 (4.1%) other constructions: 1 (0.2%)

Figure 6. IN-OUT