

Data, data documentation and analysis scripts for

Multimodal analysis of quotation in oral narratives

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Abstract

We investigate direct speech quotation in informal oral narratives by analyzing the contribution of multiple multimodal articulators (character viewpoint gestures, character facial expression, character intonation, and meaningful use of gaze) in three quote environments, or *quote sequences* – single quotes, quoted monologues and quoted dialogues – and in initial vs. non-initial position within those sequences. Our analysis draws on findings from the linguistic and multimodal realization of quotation, where multiple articulators are often observed to be co-produced with single direct speech quotes (e.g. Thompson & Suzuki 2014), especially on the so-called left boundary of the quote (Sidnell 2006). We use logistic regression to model multimodal quote production strategies across and within quote sequences, and find unique sets of multimodal articulators accompanying each quote sequence type. We do not, however, find unique sets of multimodal articulators which distinguish initial from non-initial utterances; utterance position is instead predicted by type of quote and presence of a quoting predicate. Our findings add to the growing body of research on multimodal quotation, and suggest that the multimodal production of quotations is more sensitive to the number of characters and utterances which are quoted than to the introduction of a quote sequence in discourse.

Keywords: quotation, direct speech, multimodality, viewpoint, gesture

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1 Packages

```
library(lme4)  
library(Hmisc)
```

```
R.Version()$version.string
```

```
## [1] "R version 3.1.2 (2014-10-31)"
```

```
packageVersion("lme4")
```

```
## [1] 1.1.7
```

```
packageVersion("Hmisc")
```

```
## [1] 3.14.6
```

2 Dataset

```
load ('cg3b.csv', header=T)
## entire dataset
```

```
load ('cg4b.csv', header=T)
## initial and second position utterances of QM and QD sequences
## note that QD sequences which follow an A A B... pattern (4 sequences)
are excluded
```

Both datasets contain values for the following variables. The file contains variables from several stages of the project (ELAN export, ELAN annotations, speaker variables and variables for analysis).

(I) Variables from ELAN export

1. Item: Item number
2. Begin time (hh:mm:ss:ms): Time code for the start of the quote
3. Begin time (ss.msec): Time code for the start of the quote
4. End time (hh:mm:ss:ms) Time code for the end of the quote
5. End time (ss.msec): Time code for the end of the quote
6. Duration (hh:mm:ss:ms): Duration of the quote
7. Duration (ss.msec): Duration of the quote

(II) Annotations made in ELAN

8. Speech: Transcription of the quote
9. Quotative: Classification of the utterance as a quote (yes), not a quote (no) or unsure (maybe)
10. Quote Sequence: Classification of the utterance as Quote Island (QI), initial utterance in a Quoted Monologue (QMI), non- initial utterance in a Quoted Monologue (QM), or Other (O). For Quoted Dialogues which follow an A B ... pattern: initial "A" utterance in a Quoted Dialogue (QDIa), initial "B" utterance in a Quoted Dialogue (QDIb), non-initial utterance in a Quoted Dialogue (QD). For Quoted Dialogues which follow an A A B... pattern: initial "A" utterance in a Quoted Dialogue (QDMIa), initial "B" utterance in a Quoted Dialogue (QDMIb), non-initial utterance in a Quoted Dialogue (QDM).
11. FI: Classification of the utterance as fictive interaction (1), normal quote (0) or unsure (0.5).
12. Character: An identification of the quoted character (A-E, speaker, addressee, speaker+addressee)
13. Qhead: The quoting predicate.
14. Intonation: The speaker produced character intonation during the quoted utterance (yes), did not (no) or unclear (maybe)
15. Gesture: The speaker produced a character viewpoint gesture (CVPT), another gesture (Other) or no gesture (NG).
16. Facial expression: The speaker displayed the quoted character's facial expression (yes), did not (no) or unclear (maybe).

17. Gaze: The speaker looked away from the addressee (yes), maintained gaze with the addressee (no), looked away from the addressee after the quoted utterance started (late change) or the speaker's gaze jumped around (quick shift).

(III) Speaker/File data

18. Speaker: Speaker ID number.
19. Gender: The speaker's gender.
20. File: The filename of the narrative clip.

(IV) Variables created for analysis

21. Position in sequence: Classification of the utterance as initial vs. non-initial. Initial utterances in Quoted Monologue and Quoted Dialogue sequences are marked with "i" (QMi, QDi). All non-initial utterances are not (QI, QD, QM).
22. SequenceSmall: A simplification of #10 into four categories: QI, QM, QD and Other.
23. Quoted: Binary variable indicating that the utterance is from a sequence with one (QM) or multiple (QD) speakers. QIs were coded 'QM' and Other cases were excluded.
24. IsIntonation: Binary variable indicating if the speaker used character intonation (1) or not (0). All unclear cases from #14 were coded as '0'.
25. IsFvpt: Binary variable indicating if the speaker produced character facial expression (1) or not (0). All unclear cases from #16 were coded as '0'.
26. Gaze_Any: Binary variable indicating if the speaker made a "meaningful" use of gaze. Three codes from #17 were coded as 1 (yes, late change, quick shift). Maintaining gaze with the addressee (no) was coded as 0.
27. IsCVPT: Binary variable indicating if the speaker produced a manual character viewpoint gesture (1) or no (0). All Other gestures and no gestures from #15 were coded as 0.
28. Qhead12: Binary variable indicating the presence of a quoting predicate. 1 indicates a quoting predicate was present; 0 that a bare quote was used.
29. SequenceID: Unique id for all multi-utterance sequences.
30. Pos_in_Sequence: Position in sequence for all utterances in multi-utterance sequences.
31. IsSS ("Is Single Speaker"): Binary variable indicating that the utterance was produced as part of a QI/QM (1) or QD (0).
32. IsMS ("Is Multiple Speakers"): Binary variable indicating that the utterance was produced as part of a QD (1) or QI/QM (0).
33. IsI ("Is Initial"): Binary variable indicating that the utterance was produced in initial position (1 for the following codes: QI, QMi, QDi) and 0 otherwise.
34. IsQD: Binary variable indicating that the utterance was produced in a QD (1) and 0 otherwise.
35. IsQM: Binary variable indicating that the utterance was produced in a QM (1) and 0 otherwise.
36. IsQI: Binary variable indicating that the utterance was produced in a QI (1) and 0 otherwise.
37. IsQMi: Binary variable indicating that the utterance was produced as the initial utterance in a QM (1) and 0 otherwise.

38. IsQDi: Binary variable indicating that the utterance was produced as the initial utterance in a QD (1) and 0 otherwise.

3 Codebook

(I) Linguistic features

Fictive interaction – Is the utterance an instance of fictive interaction (Pascual 2002; 2014)? If so, Yes. If not, No. If unsure, Maybe.

Quoting predicate – Enter the quoting predicate used. If none, write “bare”.

Quote sequence – In what kind of sequence does the utterance occur?

- QI – The utterance is a single utterance.
- QM – The utterance is part of a multi-utterance sequence by a single character.
- QD – The utterance is part of a multi-utterance sequence by multiple characters (AB... pattern)
- QDM – The utterance is part of a multi-utterance sequence by multiple characters (AAB... pattern)
- Other; the utterance does not nicely fall into one of the prior categories.

(II) Multimodal features

Manual gesture – CVPT – character viewpoint (McNeill 1992). Other – any gesture which is not a CPVT gesture. NG – no gesture.

Facial expression – Does the speaker’s face show aspects of the quoted speaker, e.g. affect such as fear, surprise, anger, joy? This should be an easy binary distinction. If you hesitate or are unsure, the correct choice is No. We want only to capture major facial expressions.

- Yes – the speaker’s face depicts aspects of the quoted speaker’s.
- No – it does not.

Gaze – Is the speaker looking directly at the addressee, or are the speaker and addressee making eye contact? Is the speaker looking somewhere else (not at the addressee)? Is the speaker’s gaze undirected and/or jumping all over the place?

- Yes – the speaker is gazing at the addressee
- No – the speaker is looking away from the addressee
- Late change – the speaker looks away from the addressee, but not on the left boundary of the quote
- Quick shift – the speaker’s gaze jumps all over the place

Intonation -- Does the speaker’s voice change to show aspects of the quoted speaker, e.g. changes in pitch, loudness, accent, or emotions such as joy, anger, confusion, etc.? This should be an easy binary distinction. If you hesitate or are unsure, the correct choice is No. We want only to capture major changes in intonation.

- Yes – the speaker’s voice depicts aspects of the quoted speaker’s.
- No – it does not.

4 Analysis and results

The file `sharing.R` contains code and instructions for running our models.
For each dataset, we provide:

- Starting point for each model
- Final model
- Test of model fit using the index of concordance C ('Model performance' below)

Our datasets are small; each model takes less than one minute to run.

1. Table 6: Model for QDs (equivalent to the IsMS model, and if you flip the signs on the estimates, to the IsSS model) using the `data_all` dataset

```
summary(m10 <- glmer(isQD ~ FI + IsFvpt*Gaze_Any +
  (1|Speaker)+(1|File),data=dat,family='binomial'))
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) ['glmerMod']

Family: binomial ( logit )
Formula: isQD ~ FI + IsFvpt * Gaze_Any + (1 | Speaker) + (1 | File)
Data: dat

AIC      BIC    logLik deviance df.resid
719.1    751.0   -352.6   705.1     688

Scaled residuals:
    Min       1Q   Median       3Q      Max
-3.4595 -0.5154 -0.2235  0.5431  4.7523

Random effects:
 Groups Name      Variance Std.Dev.
File    (Intercept) 1.6436   1.2820
Speaker (Intercept) 0.8989   0.9481
Number of obs: 695, groups: File, 85; Speaker, 25

Fixed effects:
 Estimate Std. Error z value Pr(>|z|)
(Intercept)    -0.2294    0.3935  -0.583    0.5600
FI              -2.0178    0.2804  -7.196 6.22e-13 ***
IsFvpt          -0.4805    0.4232  -1.135    0.2562
Gaze_Any        -0.6897    0.3367  -2.048    0.0405 *
IsFvpt:Gaze_Any  1.0975    0.4847   2.264    0.0235 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
(Intr) FI      IsFvpt Gz_Any
FI            -0.080
IsFvpt        -0.444 -0.053
Gaze_Any      -0.564  0.018  0.512
IsFvpt:Gz_A  0.376 -0.013 -0.825 -0.664
```

Model performance

```
somers2(fitted(m10),dat$isQD)
```


C	Dxy	n	Missing
0.8883098	0.7766197	695.0000000	0.0000000

2. Table 7: Model for multiple speakers using the data_subset dataset

```
summary(m1 <- glmer(IsMS ~ FI + IsFvpt +
(1|Speaker),data=dat2,family='binomial'))
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) ['glmerMod']
```

```
Family: binomial (logit)
Formula: IsMS ~ FI + IsFvpt + (1 | Speaker)
Data: dat2
```

AIC	BIC	logLik	deviance	df.resid
314.9	329.3	-153.5	306.9	266

Scaled residuals:

Min	1Q	Median	3Q	Max
-2.8093	-0.7323	0.3852	0.5698	1.9666

Random effects:

Groups	Name	Variance	Std.Dev.
Speaker	(Intercept)	0.8495	0.9217

Number of obs: 270, groups: Speaker, 25

Fixed effects:

	Estimate	Std. Error	z	value	Pr(> z)
(Intercept)	0.8531	0.3232	2.640	0.0083	**
FI	-2.2876	0.3627	-6.307	2.84e-10	***
IsFvpt	0.7429	0.3386	2.194	0.0282	*

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:

	(Intr)	FI
FI	-0.247	
IsFvpt	-0.366	-0.300

Model performance

```
somers2(fitted(m1),dat2$IsMS)
C          Dxy          n          Missing
0.8273305  0.6546610  270.0000000  0.0000000
```

3. Table 8: Model for QIs using the data_all dataset

```
summary(m6 <- glmer(isQI ~ FI + IsFvpt*Gaze_Any + Qhead12 + (1|Speaker) +
(1|File),data=dat,family='binomial'))
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) ['glmerMod']
```

```
Family: binomial (logit)
Formula: isQI ~ FI + IsFvpt * Gaze_Any + Qhead12 + (1 | Speaker) + (1 |
File)
```

```

Data: dat

AIC      BIC    logLik deviance df.resid
845.2    881.5   -414.6   829.2     687

Scaled residuals:
    Min       1Q   Median       3Q      Max
-2.0878 -0.6950 -0.3178  0.7183  3.6667

Random effects:
    Groups Name          Variance Std.Dev.
File      (Intercept) 0.8510    0.9225
Speaker   (Intercept) 0.5994    0.7742
Number of obs: 695, groups: File, 85; Speaker, 25

Fixed effects:
    Estimate Std. Error z value Pr(>|z|)
(Intercept)   -1.2602    0.3700  -3.406 0.000660 ***
FI              0.7274    0.2111   3.446 0.000570 ***
IsFvpt1        0.5512    0.3652   1.509 0.131265
Gaze_Any1      0.8217    0.2900   2.834 0.004599 **
Qhead12        0.8111    0.2320   3.496 0.000472 ***
IsFvpt1:Gaze_Any1 -0.8769    0.4160  -2.108 0.035013 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
    (Intr) FI      IsFvpt1 Gz_Any1 Qhead12
FI          -0.243
IsFvpt1     -0.414 -0.075
Gaze_Any1   -0.538  0.012  0.554
Qhead12     -0.477  0.144 -0.024 -0.003
IsFvpt1:G_A1 0.355  0.039 -0.832 -0.671  0.016

```

Model performance

```

somers2(fitted(m6),dat$sisQI)
C          Dxy          n          Missing
0.8306891  0.6613781 695.0000000  0.0000000

```

4. Table 9: Model for QMs using the data_all dataset

```

summary(m9 <- glmer(isQM ~ FI + IsIntonation + Qhead12 +
(1|Speaker)+(1|File),data=dat,family='binomial'))
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) ['glmerMod']

Family: binomial ( logit )
Formula: isQM ~ FI + IsIntonation + Qhead12 + (1 | Speaker) + (1 | File)
Data: dat

AIC      BIC    logLik deviance df.resid
638.1    665.4   -313.0   626.1     689

Scaled residuals:
    Min       1Q   Median       3Q      Max
-1.6011 -0.4617 -0.3296 -0.2044  4.7864

```

```

Random effects:
  Groups   Name      Variance Std.Dev.
File      (Intercept) 0.9298   0.9642
Speaker   (Intercept) 0.1796   0.4238
Number of obs: 695, groups: File, 85; Speaker, 25

Fixed effects:
      Estimate Std. Error z value Pr(>|z|)
(Intercept)  -1.5194      0.3478  -4.369 1.25e-05 ***
FI             1.0537      0.2390   4.408 1.04e-05 ***
IsIntonation  -0.4172      0.2277  -1.832 0.066929 .
Qhead12       -0.9302      0.2522  -3.688 0.000226 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) FI      IsIntn
FI             -0.373
IsIntonatin    -0.366 -0.064
Qhead12         -0.405  0.038  0.061

```

Model performance

```

somers2(fitted(m9), dat$sisQM)
C          Dxy          n          Missing
0.8218718  0.6437437 695.0000000  0.0000000

```

5. Table 10: Model for initial utterances (IsI) using the data_all dataset

```

summary(m3b <- glmer(IsI ~ FI + IsFvpt*Gaze_Any + Qhead12 +
  (1|Speaker)+(1|File), data=dat, family='binomial'))
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) ['glmerMod']

Family: binomial ( logit )
Formula: IsI ~ FI + IsFvpt * Gaze_Any + Qhead12 + (1 | Speaker) + (1 |
File)
Data: dat

AIC      BIC    logLik deviance df.resid
819.4    855.7   -401.7   803.4     687

Scaled residuals:
      Min       1Q   Median       3Q      Max
-2.9067 -0.7965  0.4256  0.6483  2.8685

Random effects:
  Groups   Name      Variance Std.Dev.
File      (Intercept) 0.1771   0.4208
Speaker   (Intercept) 0.3588   0.5990
Number of obs: 695, groups: File, 85; Speaker, 25

Fixed effects:
      Estimate Std. Error z value Pr(>|z|)
(Intercept)    -0.7127      0.3152  -2.262  0.02373 *
FI              0.5577      0.2080   2.681  0.00734 **

```

```

IsFvpt          0.4220      0.3526   1.197  0.23136
Gaze_Any        0.6131      0.2831   2.166  0.03030 *
Qhead12         1.4924      0.2150   6.941  3.9e-12 ***
IsFvpt:Gaze_Any -0.7681      0.4066  -1.889  0.05886 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```

Correlation of Fixed Effects:
(Intr) FI      IsFvpt Gz_Any Qhed12
FI            -0.262
IsFvpt        -0.454 -0.097
Gaze_Any      -0.578 -0.010  0.532
Qhead12       -0.469  0.182 -0.007 -0.001
IsFvpt:Gz_A   0.392  0.063 -0.833 -0.671  0.004

```

Model performance

```

somers2(fitted(m3b), dat$IsI)
C          Dxy          n          Missing
0.7875862  0.5751723 695.0000000  0.0000000

```

6. Table 11: Model for initial QM utterances (IsQM_i) using the data_subset dataset

```

summary(m5 <- glmer(IsMi ~ FI + Qhead12 +
(1|Speaker), data=dat2, family='binomial'))
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) ['glmerMod']

```

```
Family: binomial (logit)
```

```
Formula: IsMi ~ FI + Qhead12 + (1 | Speaker)
Data: dat2
```

```

AIC      BIC    logLik deviance df.resid
275.6    290.0   -133.8   267.6     266

```

Scaled residuals:

```

   Min       1Q   Median       3Q      Max
-0.8579 -0.4835 -0.4622 -0.3110  3.1832

```

Random effects:

```

Groups Name          Variance Std.Dev.
Speaker (Intercept) 0.02958  0.172
Number of obs: 270, groups: Speaker, 25

```

Fixed effects:

```

Estimate Std. Error z value Pr(>|z|)
(Intercept) -2.3053      0.4100  -5.622 1.89e-08 ***
FI           1.1469      0.3217   3.565 0.000364 ***
Qhead12      0.7920      0.3855   2.055 0.039913 *
---

```

```
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Correlation of Fixed Effects:

```

(Intr) FI
FI      -0.554
Qhead12 -0.843  0.258

```

Model performance

```
somers2(fitted(m5), dat2$IsMi)
C          Dxy          n          Missing
0.6988513  0.3977026 270.0000000  0.0000000
```

7. Table 12: Model for initial QD utterances (IsQDi) using the data_subset dataset

```
summary(m7 <- glmer(IsDi ~ FI + Qhead12 +
(1|Speaker), data=dat2, family='binomial'))
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) ['glmerMod']
```

```
Family: binomial (logit)
Formula: IsDi ~ FI + Qhead12 + (1 | Speaker)
Data: dat2
```

```
AIC      BIC    logLik deviance df.resid
298.5    312.9   -145.3   290.5     266
```

Scaled residuals:

```
      Min      1Q  Median      3Q      Max
-0.8501 -0.8501 -0.4249  1.1764  4.0706
```

Random effects:

```
Groups Name      Variance Std.Dev.
Speaker (Intercept) 4e-14    2e-07
Number of obs: 270, groups: Speaker, 25
```

Fixed effects:

```
Estimate Std. Error z value Pr(>|z|)
(Intercept) -1.4205    0.3401  -4.177 2.96e-05 ***
FI          -1.3871    0.3747  -3.701 0.000214 ***
Qhead12      1.0956    0.3671   2.985 0.002839 **
---
```

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:

```
(Intr) FI
FI      -0.233
Qhead12 -0.886  0.043
```

Model performance

```
somers2(fitted(m7), dat2$IsDi)
C          Dxy          n          Missing
0.7286354  0.4572708 270.0000000  0.0000000
```

8. (Not reported in paper) Model for initial utterances (IsQDi+IsQMj) using the data_subset dataset

```
summary(m3 <- glmer(IsI ~ Qhead12 + (1|Speaker), data=dat2, family='binomial'))
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) ['glmerMod']
Family: binomial (logit)
```

```
Formula: IsI ~ Qhead12 + (1 | Speaker)
Data: dat2
```

```
AIC      BIC    logLik deviance df.resid
359.6    370.4   -176.8   353.6     267
```

```
Scaled residuals:
    Min       1Q   Median       3Q      Max
-1.20065 -1.20065  0.09481  0.83288  1.55456
```

```
Random effects:
  Groups Name          Variance Std.Dev.
Speaker (Intercept) 0          0
Number of obs: 270, groups: Speaker, 25
```

```
Fixed effects:
  Estimate Std. Error z value Pr(>|z|)
(Intercept) -0.8824      0.2427  -3.636 0.000277 ***
Qhead12      1.2481      0.2844   4.388 1.14e-05 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
Correlation of Fixed Effects:
(Intr)
Qhead12 -0.853
```

Model performance

```
somers2(fitted(m3), dat2$IsI)
C      Dxy      n      Missing
0.6259259 0.2518519 270.0000000 0.0000000
```

9. (Not reported in paper) Model for continuing utterances (IsQD2+IsQM2) using the data_all dataset

```
summary(m5 <- glmer(IsC2 ~ Gaze_Any + Qhead12 +
(1|Speaker), data=dat, family='binomial'))
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) ['glmerMod']
Family: binomial ( logit )
Formula: IsC2 ~ Gaze_Any + Qhead12 + (1 | Speaker)
Data: dat
```

```
AIC      BIC    logLik deviance df.resid
675.2    693.4   -333.6   667.2     691
```

```
Scaled residuals:
    Min       1Q   Median       3Q      Max
-0.7140 -0.5102 -0.4068 -0.4068  2.4582
```

```
Random effects:
  Groups Name          Variance Std.Dev.
Speaker (Intercept) 0          0
Number of obs: 695, groups: Speaker, 25
```

```
Fixed effects:
  Estimate Std. Error z value Pr(>|z|)
```

```

(Intercept)  -0.6737      0.2002  -3.365 0.000765 ***
Gaze_Any      -0.4530      0.2048  -2.212 0.026981 *
Qhead12       -0.6722      0.1993  -3.372 0.000746 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

Correlation of Fixed Effects:

```

(Intr) Gz_Any
Gaze_Any -0.632
Qhead12  -0.563 -0.063

```

Model performance

```

somers2(fitted(m5),dat$IsC2)
C          Dxy          n      Missing
0.6135251  0.2270503 695.0000000  0.0000000

```