Appendix: Model outputs

Below are the full model outputs (including additional statistical information such as coefficients and standard errors) for the data presented in Figures 11-16 for reproducibility.

1 versus B-handshape (Figure 11)

We fit a hierarchical logistic regression, with the outcome variable the point being a B- or a 1-handshape (where the model is predicting the likelihood that the point is a 1-handshape), and with the predictors group (sign, gesture; treatment coded with sign as the reference level) and target (self, addressee, other-entity; treatment coded with self as the reference level). We included intercept adjustments by subject as well as slope adjustments for the pointing type predictor by subject.

	1 vs B-handshape model estimate (std. error)
(Intercept)	0.67 (0.25)
group (gesturer)	-3.41 (0.55)
pointing type (addressee)	5.45 (2.22)
pointing type (other-entity)	2.35 (0.43)
group (gesturer):pointing type (addressee)	-4.78 (3.00)
group (gesturer):pointing type (other-entity)	-0.37 (0.72)
AIC	944.08
BIC	1003.20
Log Likelihood	-460.04
Num. obs.	1019
Num. groups: subj	51
Var: subj (Intercept)	0.90

Var: subj pointing type (addressee)	7.61
Var: subj pointing type (other-entity)	1.16
Cov: subj (Intercept) pointing type (addressee)	-0.21
Cov: subj (Intercept) pointing type (other-entity)	-0.56
Cov: subj pointing type (addressee) pointing type (other-entity)	1.95

Hierarchical logistic regression coefficient estimates and standard errors.

One versus two hands (Figure 12)

We fit a hierarchical (mixed effects) logistic regression, with the outcome variable the number of hands used to point (where the model is predicting the likelihood that the point is two handed), and with the predictors group (sign, gesture; treatment coded with sign as the reference level) and target (self, addressee, other-entity; treatment coded with self as the reference level). We included intercept adjustments by subject as well as slope adjustments for the pointing type predictor by subject.

	one vs two hand model estimate (std. error)
(Intercept)	-5.38 (0.92)
group (gesturer)	5.13 (1.03)
pointing type (addressee)	1.82 (1.04)
pointing type (other-entity)	0.70 (1.17)
group (gesturer):pointing type (addressee)	-3.01 (1.13)
group (gesturer):pointing type (other-entity)	-2.97 (1.14)
AIC	647.27
BIC	707.49
Log Likelihood	-311.63
Num. obs.	1117

Num. groups: subj	51
Var: subj (Intercept)	3.53
Var: subj pointing type (addressee)	1.46
Var: subj pointing type (other-entity)	2.34
Cov: subj (Intercept) pointing type (addressee)	-2.21
Cov: subj (Intercept) pointing type (other-entity)	-0.89
Cov: subj pointing type (addressee) pointing type (addressee)	0.98

Hierarchical logistic regression coefficient estimates and standard errors.

Right hand versus left hand (Figure 13)

We fit a hierarchical (mixed effects) logistic regression, with the outcome variable the point being right or left hand use (where the model is predicting the likelihood that the point is made with the left hand), and with the predictor group (sign, gesture; treatment coded with sign as the reference level). We included intercept adjustments by subject.

	right or left model
	estimate (std. error)
(Intercept)	-3.66 (0.54)
catgesturers	3.19 (0.75)
HandednessLeft-handed	6.00 (1.43)
catgesturers:HandednessLeft-handed	-3.39 (1.95)
AIC	572.15
BIC	596.37
Log Likelihood	-281.08
Num. obs.	938
Num. groups: subj	47

Var: subj (Intercept)	3.82

Hierarchical logistic regression coefficient estimates and standard errors.

Duration by pointing type (Figure 14)

We fit a hierarchical linear regression, with the outcome variable the (natural) log of the duration of the point, and with the predictors group (sign, gesture; treatment coded with sign as the reference level) and target (self, addressee, other-entity; treatment coded with self as the reference level). We included intercept adjustments by subject as well as slope adjustments for the pointing type predictor by subject.

	duration model estimate (std. error)
(Intercept)	5.50 (0.06)
group (gesturer)	1.26 (0.10)
pointing type (addressee)	-0.07 (0.11)
pointing type (other-entity)	0.07 (0.07)
group (gesturer):pointing type (addressee)	-0.07 (0.17)
group (gesturer):pointing type (other-entity)	-0.16 (0.12)
AIC	1890.71
BIC	1954.30
Log Likelihood	-932.36
Num. obs.	984
Num. groups: subj	50
Var: subj (Intercept)	0.05
Var: subj pointing type (addressee)	0.15
Var: subj pointing type (other-entity)	0.05

Cov: subj (Intercept) pointing type (addressee)	-0.08
Cov: subj (Intercept) pointing type (other-entity)	-0.03
Cov: subj pointing type (addressee) pointing type (other-entity)	0.08
Var: Residual	0.36

Hierarchical linear regression coefficient estimates and standard errors.

Duration by clause position (Figure 15)

We fit a hierarchical linear regression, with the outcome variable the (natural) log of the duration of the point, and with the predictors group (sign, gesture; treatment coded with sign as the reference level) and clause position (final, non-final; treatment coded with non-final as the reference level). We included intercept adjustments by subject as well as slope adjustments for the position predictor by subject.

	duration (with clause position) model estimate (std. error)
(Intercept)	5.36 (0.04)
group (gesturer)	1.32 (0.06)
position (final)	0.67 (0.08)
group (gesturer):position (final)	-0.66 (0.14)
AIC	1777.13
BIC	1816.27
Log Likelihood	-880.57
Num. obs.	984
Num. groups: subj	50
Var: subj (Intercept)	0.02
Var: subj position (final)	0.07
Cov: subj (Intercept) position (final) -0.01	

Var: Residual	0.33

Hierarchical linear regression coefficient estimates and standard errors.

Contact (Figure 16)

We fit a hierarchical logistic regression, with the outcome variable the point being contact (where the model is predicting the likelihood that the point makes contact with the body), and with the predictor group (sign, gesture; treatment coded with sign as the reference level). We included intercept adjustments by subject.

	contact model estimate (std. error)
(Intercept)	2.37 (0.31)
group (gesturer)	-4.15 (0.51)
AIC	288.31
BIC	300.07
Log Likelihood	-141.16
Num. obs.	372
Num. groups: subj	46
Var: subj (Intercept)	0.53

Hierarchical logistic regression coefficient estimates and standard errors.