

S1

Play gesture ethogram

Gesture type descriptions after [1]

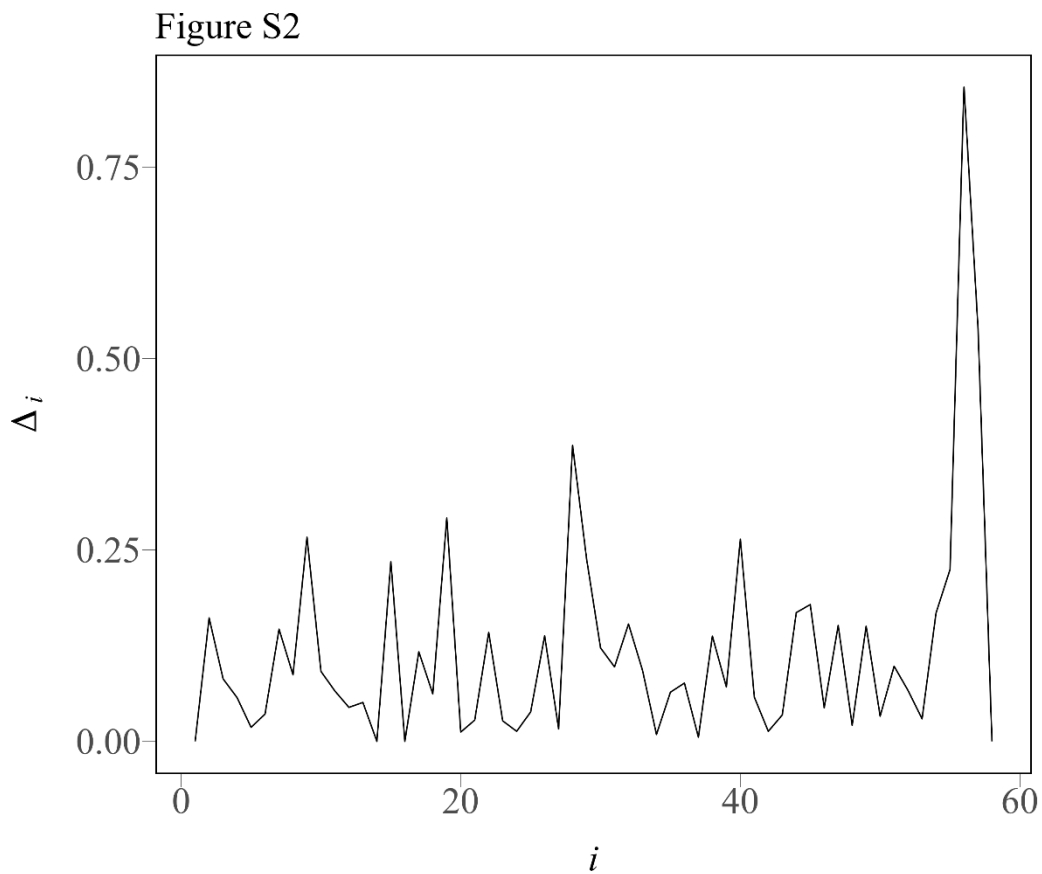
Gesture type	Description
Arm raise	Raise arm and/or hand vertically in the air
Arm shake	Small repeated back and forth motion of the arm
Arm swing	Large back and forth movement of the arm held below the shoulder (individual can hold an object)
Arm wave	Large repeated back and forth movement of the arm (s) raised above the shoulder
Bite	Part of recipient's body is held between the teeth of the signaller
Bow	Signaller bends forward from the waist while standing
Clap	Both palms moved towards each other and brought together with an audible contact
Dangle	To hang from one or both arms from a branch above another individual, this is audible as there is normally significant disturbance of the canopy
Directed push	A light short non-effective push that indicates a direction of desired movement, immediately followed by the recipient moving as indicated
Drum object (palms)	Short hard audible contact of alternate palms against an object
Drum other	As 'drum object (palms)' but contact is with recipient's body
Embrace	Signaller wraps both arms around the recipient and maintains physical contact
Feet shake	Repeated back and forth movement of feet from the ankles
Grab	The hand or foot is firmly closed over part of the recipient's body; 1- or 2-handed; Individual can hold onto the body of the recipient
Grab-pull	As 'Grab' but closed hand contact is maintained and a force exerted to move the recipient from its current position; 1- or 2-handed
Gallop	An exaggerated running movement where the contact of the hands and feet is deliberately audible
Hand on	Palm or knuckles of the hand is placed on the recipient, contact lasts for more than 2 s
Hand shake	Repeated back and forth movement of hand (s) from the wrist
Head butt	Head is briefly and firmly pushed into the body of the recipient
Head nod	Repeated back and forth movement of the head; head nodding or shaking
Head stand	Signaller bends forward and places head on the ground
Hide face	Face is hidden by the hands and/or arms
Hit with object	An object is brought into short hard contact with the body of the recipient
Jump	While bipedal both feet leave the ground simultaneously, accompanied by horizontal displacement through the air
Kick	Foot is brought into short hard contact with the recipient's body or an object in a movement from the hip with a horizontal element
Knock object	Back of the hand or knuckles are brought into short hard audible contact with an object
Leaf clipping	Strips are torn from a leaf (or leaves) held in the hand using the teeth
Leg swing	Large back and forth movement of the leg from the hip
Look	Signaller holds an eye-contact position with the recipient— minimum duration 2 s
Object in mouth approach	Signaller approaches recipient while carrying an object in the mouth (e.g. a small branch)
Object move	Object is displaced in one direction, contact is maintained through movement
Object shake	Repeated back and forth movement of an object; 1- or 2-handed
Pirouette	Signaller turns around their body's vertical axis while also displacing along the ground

Gesture type	Description
Poke	Firm, brief push of one or more fingers into the recipient's body
Pounce	Signaller displaces through the air to land quadrupedally on the body of the recipient
Punch object / ground	Movement of whole arm, with short hard audible contact of closed fist to an object or the ground
Punch other	As 'punch object/ground' but contact is with recipient's body
Push	Palm in contact with recipient's body and force is exerted in attempt to displace recipient
Reach	Arm extended to the recipient with hand in an open, palm upwards position (no contact)
Roll over	The signaller rolls onto their back exposing their stomach, normally accompanied by repeated movements of the arms and/or legs
Side roulade	Body is rotated around the head- feet axis while lying on the ground with horizontal displacement along the ground
Slap object	Movement of the arm from the shoulder with hard short contact of the palm of the hand to an object; 1- or 2-handed
Slap object with object	As 'slap object' but the hand holds an object which is brought into contact with another object (e.g. a branch is slapped against a tree); 1- or 2-handed
Slap other	As 'slap object' but the palm is brought into contact with the recipient's body; 1- or 2-handed
Somersault	Signaller's body is curled into a compact position on the ground, and rolled forwards so the feet are brought over the head and returned to sitting position
Stiff walk	Walk quadrupedally with a slow exaggerated movement
Stomp	Sole of one foot is lifted vertically and brought into a short hard audible contact with the surface being stood upon (e.g. ground or a branch)
Stomp other	As 'stomp' but contact is made with recipient
Stomp 2-feet	As 'stomp single' but both feet used
Stomp 2-feet alternate	As 'stomp 2-feet' but both feet are used alternately (e.g. walking by stomping with feet alternately)
Stomp 2-feet other	As 'stomp 2-feet' but contact is made with recipient
Stomp 2-feet other alternate	As 'stomp 2-feet alternate' but contact is made with recipient
Tandem walk	Subject positions arm over the body of the recipient and both walk forward while maintaining position
Tap object	Movement of the arm from the wrist or elbow, with firm short contact of the fingers to the object
Tap other	As 'tap object' but contact is with recipient's body
Throw object	Object is moved and released so that there is displacement through the air after moment of release
Touch other	Light contact of the palm and/or fingers on the body of the recipient, contact under 2 s
Water splash, 1 hand	Hand is moved vigorously through the water so that there is audible displacement of the water

S2

Differences in magnitude of D (i.e. Δ_i) between the i -th and the $(i-1)$ -th gesture type with the smallest total duration, D .

To identify any potential breakpoint in values of D , we investigated potential cluster boundaries by defining the differences in the orders of magnitude between successive D -values, as $\Delta_i = \log(D_i/D_{i-1})$, where Δ_i is the difference in magnitude between the i -th D value and its consecutive D -value (note, D -values are listed in ascending order). Evidence for a clear breakpoint was explored by plotting Δ_i against i (Figure S2); no such clear breakpoint was seen.



S3

The effect of sorting by f , d or D Rationale and Methods

We explored whether the law of abbreviation emerges when sorting gesture types by D , f or d . We wished to investigate the extent to which any appearance of the law of abbreviation in subsets produced in this way could be merely due to the sorting itself, rather than an effect of compression.

For this reason, we considered the three variables for sorting, i.e. D , f , and d , and two orders, i.e. ascending and descending, which gives six possible configurations. The dataset relevant for the law of abbreviation can be seen as a matrix with two columns, f and d , and gesture types as rows.

For each configuration, we used a Monte Carlo procedure to estimate the expected Spearman correlation between f and d , and the expected p-value of the corresponding correlation test over the first n types, according to the sorting criterion for the ensemble of permutations of the original dataset. For every n between 5 and 58, expectations were estimated by averages over T randomizations of the dataset. Every randomization was produced permuting the contents of one of the columns of the matrix (f or d). We used $T = 10^5$.

In the absence of any statistical bias, the expected Spearman correlation should be zero [2] and the expected p-value should be 0.5. The latter follows from the fact that p-values are uniformly distributed within the interval $[0, 1]$ under the null hypothesis [3]. The expectation of a continuous random variable within the interval $[a, b]$ is $(a+b)/2$ [4]. In our case, the interval is $[0, 1]$ and then expected p-value is 0.5.

Results

Figure S3-1 shows the estimates of the expected Spearman correlation and the corresponding p-value as a function of n . When sorting by f and d , the estimates matched the theoretical predictions above. In contrast, sorting by D deviated from these predictions in two directions: for sufficiently low n , the Spearman correlation was negative and the p-value was below 0.5, indicating that sorting by D favours the emergence of the law of abbreviation. The curves produced in ascending order and those produced in descending order were very similar. In light of the findings above in relation to sorting by D , two questions arise: first, could the bias be attributed to the empirical distribution of values of f and d ? Notice that the permutations preserve the original values. The second and key question is: could sorting by D explain completely the emergence of the law of abbreviation in our dataset?

To address the first question, we controlled for role of the empirical distributions of values by replacing the true values of f and d by uniformly random numbers in the interval $[0,1]$. Qualitatively, the results were the same as those of the original data: a statistical bias when sorting by D and no statistical bias when sorting by f or d . Thus, the bias is not unique to our dataset.

To address the second question, we defined a new statistic: S , the average of the Spearman correlation between f and d over increasing length prefixes of the matrix up to length n after sorting rows by a certain variable in a certain order (ascending or descending). A prefix of the matrix of length i consists of the i first rows of the matrix (we have referred to prefixes as subsets, a more popular but ambiguous term, in the main article).

The statistic is defined as

$$S = \sum_{i=5}^n \rho_i,$$

where ρ_i is the Spearman correlation between f and d over the i top cells of the matrix after sorting the rows of the matrix in some way.

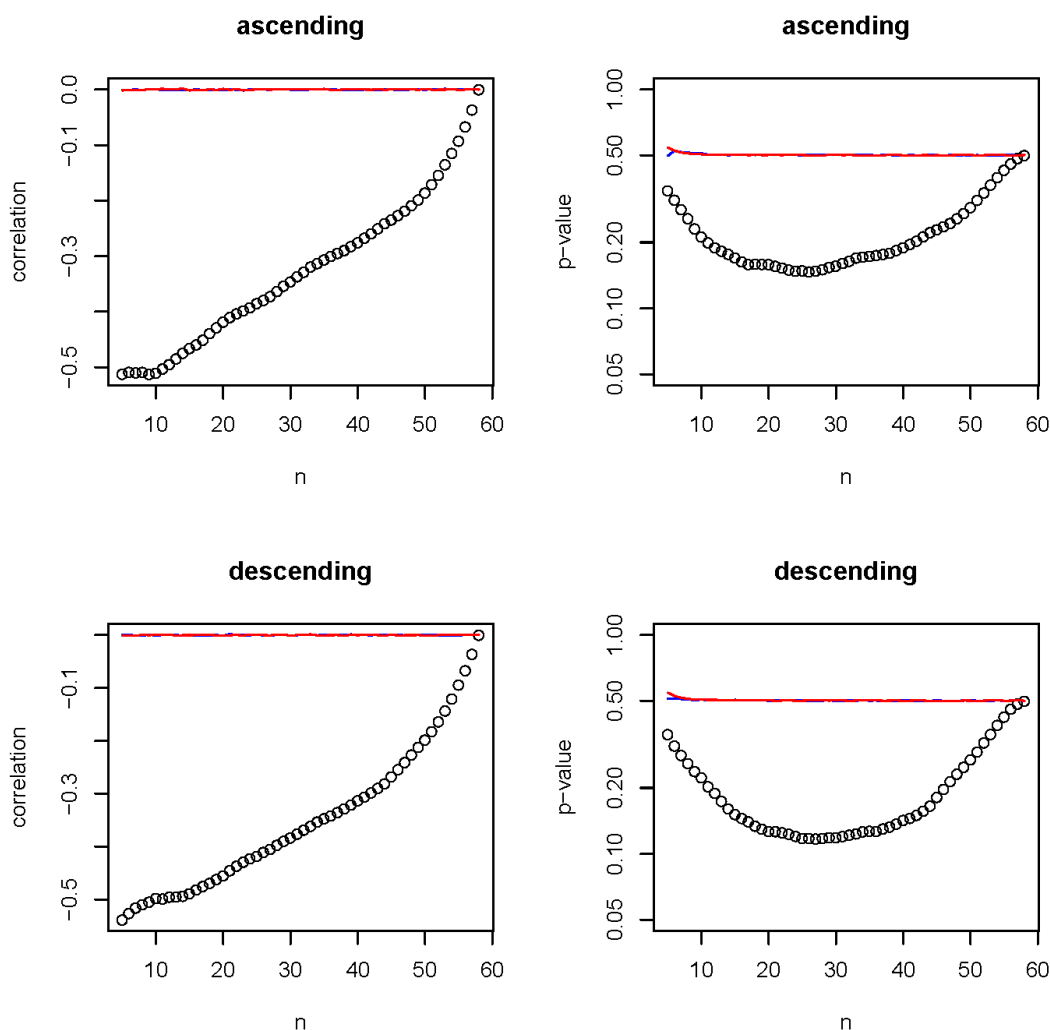


Figure S3-1: Estimates of the expected Spearman correlation and the expected p-value as a function of n when sorting by D (circles), f (blue line) and d (red line). Top: ascending order. Bottom: descending order.

For each of the six possible configurations, we took all values of n between 5 and 58 and calculated the true S and the corresponding p-value. The p-value was calculated using a Monte Carlo two-sided test to assess if the absolute value of S is significantly high with respect to the values of S that are obtained in randomizations of the original matrix that have been sorted according to the same criterion used to calculate the true S . The p-value was estimated over T^* randomizations of the matrix. We used $T^*=10^4$.

Figure 2 shows the value of the statistic S and the p-value of the Monte Carlos test of significance as a function of n . When sorting in ascending order by D , S was negative and tending to increase as n increases while the corresponding p-value was below the significance level from $n=7$ until about $n=40$. Therefore, sorting increasingly by D one finds a concordance with the law of abbreviation that cannot be fully explained by the prior bias seen in Figure S3-1, in accordance with our compression hypothesis. By contrast, when sorting in ascending order

by f and d , S was close to zero and the p-value was never below the significance level. Thus the law of abbreviation is missing in these orders.

When sorting in descending order by D , S was negative (as expected for the law of abbreviation) but the p-values were above 0.5 (Figure S3-2). Thus, selecting the gestures with the highest D , one obtains a concordance with the law of abbreviation that is an artifact of the bias reported in Figure S3-1.

When sorting in descending order by d , S was negative (as expected by the law of abbreviation) and small for sufficiently small n while the p-values passed below the significance level before $n = 20$. Thus, selecting the longest types one finds a concordance with the law of abbreviation that cannot be explained by any prior bias (recall Figure S3-1). This finding is consistent with the significant negative correlation between f and d for prefixes of length 6, 7, 12 and 13 reported in the main article. Our new supporting evidence could be due to the fact that S gives more weight to initial trends. To calculate S for a given prefix length n , the 5-th point participates in all the ρ_i 's, the 6-th point in all the ρ_i 's except one, the 7-th point in all the ρ_i 's except two, ... and so on.

When sorting in descending order by f , S was positive (the opposite trend of the law of abbreviation) and never significant but the p-values reached a minimum close to the significance level for small n . Thus, selecting the most frequent types, a slight (though not significant) tendency to an anti-law of abbreviation was found for small n , a behavior that cannot be explained by any prior bias according to Figure S3-1.

To sum up, we reported in the main article that the law of abbreviation emerges when sorting gesture types by D and only rarely when sorting by f or d (ascending or descending). Our further analyses here support that for the ascending sorting by D and for a narrower domain in descending order by d , concordance with the law of abbreviation is not an artefact of sorting only.

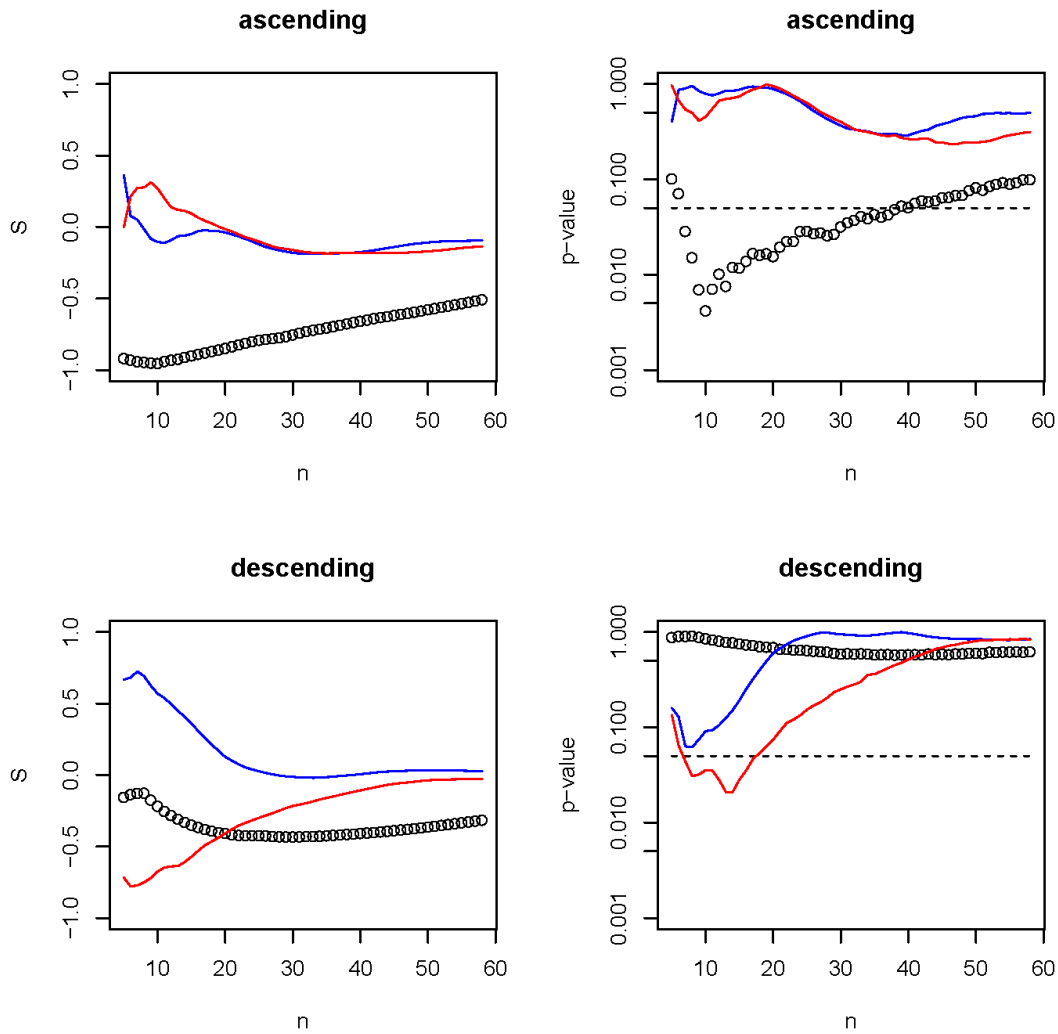


Figure S3-2: S , the average Spearman correlation statistic and the p-value of the Monte Carlo significance test as a function of n when sorting by D (circles), f (blue line) and d (red line). In the right subfigures, the dashed line indicates the significance level of 0.05. Top: ascending order. Bottom: descending order.

For completeness, Fig. S3-3 shows a comparison of the true values of S against the values of S that are obtained in the randomizations.

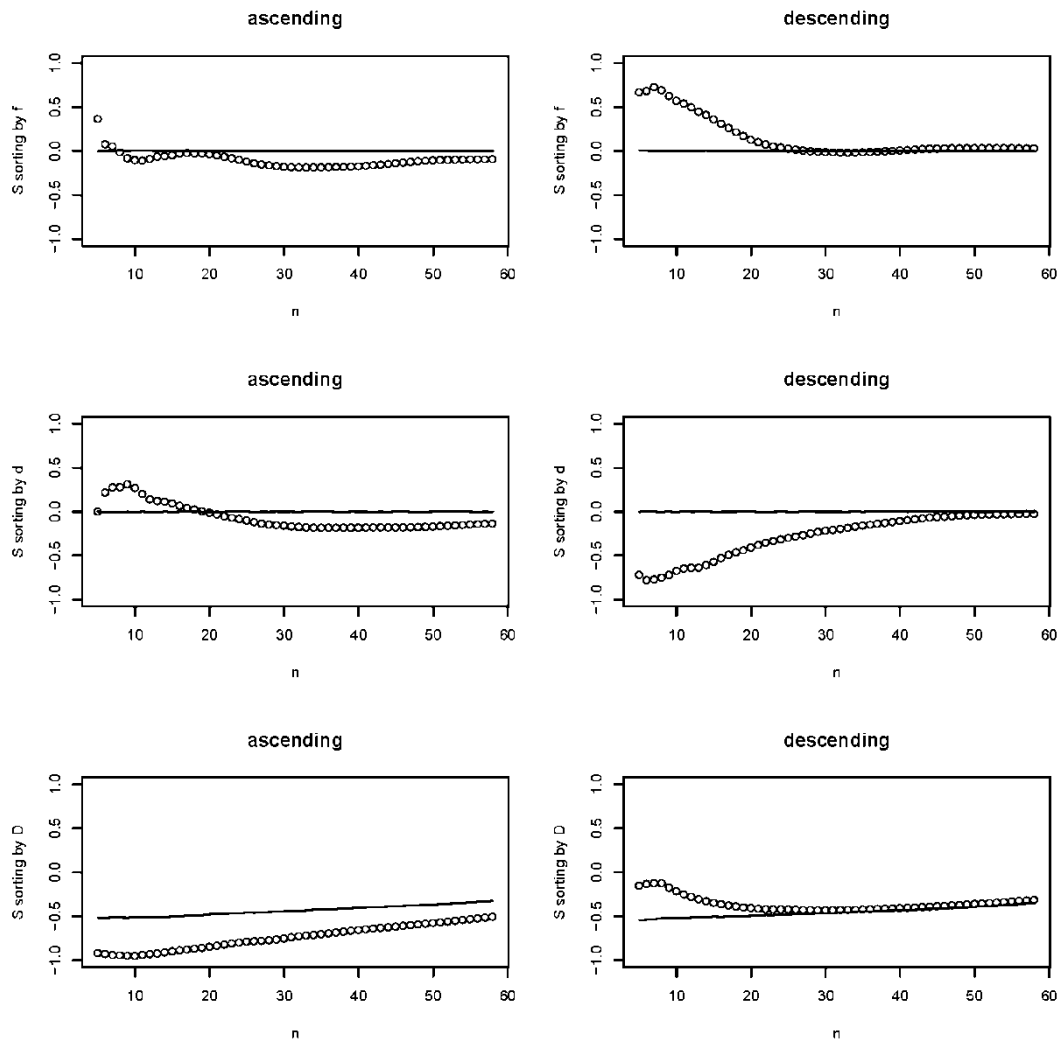


Figure S3-3. S , the true average Spearman correlation statistic (circles), against the same average in randomizations (solid line) for all six possible configurations. Left: ascending order. Right: descending order. Top: sorting by f . Centre: sorting by d . Bottom: sorting by D .

The following R code was used to generate the information needed for Figure S3-1.

```

replicas = 100000
random_data <- FALSE

run <- function(criterion, sign, file) {
t <- read.table("DataL_processed.txt", header = TRUE)
n <- nrow(t)
if (!random_data) {
  f <- t$frequency
  d <- t$mean_duration
  D <- f*d
  t <- data.frame(f, d, D)
}
cat("Generating", file, "\r\n")
sink(file)
cat("length correlation_mean correlation_sd p_value_mean p_value_sd NA_counter\n")
for (prefix_length in 5:n) {
  correlation_test <- data.frame(estimate = double(), p.value = double())
  NA_counter <- 0
  i <- 1
  while (i <= replicas) {
    if (random_data) {
      f <- runif(n, 0, 1)
      d <- runif(n, 0, 1)
      D <- f*d
      t <- data.frame(f, d, D)
    } else {
      d <- sample(t$d)
      t <- data.frame(f=t$f, d, D=t$f*d)
    }
    # Ordering criterion
    if (criterion == "D") {
      t <- t[order(sign*t$D),]
    } else if (criterion == "f") {
      t <- t[order(sign*t$f),]
    } else if (criterion == "d") {
      t <- t[order(sign*t$d),]
    }
    t_prefix <- t[1:prefix_length, ]
    correlation <- cor.test(t_prefix$f, t_prefix$d, method="spearman")
    if (is.na(correlation$estimate)) {
      NA_counter <- NA_counter + 1
    }
    else {
      new_row <- data.frame(estimate = correlation$estimate, p.value = correlation$p.value)
      correlation_test <- rbind(correlation_test, new_row)
      i <- i + 1
    }
  }
}
}

```

```
stopifnot(nrow(correlation_test) == replicas)
average <- mean(correlation_test$estimate)
stopifnot(!is.na(average))
cat(prefix_length, average, sd(correlation_test$estimate), mean(correlation_test$p.value),
sd(correlation_test$p.value), NA_counter, "\n")
}
sink()
}
```

```
run("D", 1, "correlation_test_total_d_ascending.txt")
run("f", 1, "correlation_test_f_ascending.txt")
run("d", 1, "correlation_test_mean_d_ascending.txt")
```

```
run("D", -1, "correlation_test_total_d_descending.txt")
run("f", -1, "correlation_test_f_descending.txt")
run("d", -1, "correlation_test_mean_d_descending.txt")
```

The following R code was used to generate the information needed for Figures S3-2 and S3-3.

```

n_min <- 5
replicas = 10000

two_sided <- TRUE
input <- "DataL_processed.txt"

get_mean_correlation <- function(t, n, criterion, sign) {
  # Ordering criterion
  if (criterion == "D") {
    t <- t[order(sign*t$D),]
  } else if (criterion == "f") {
    t <- t[order(sign*t$f),]
  } else if (criterion == "d") {
    t <- t[order(sign*t$d),]
  }
  mean_correlation <- 0
  for(prefix_length in n_min:n) {
    t_prefix <- t[1:prefix_length, ]
    correlation <- cor.test(t_prefix$f, t_prefix$d, method="spearman")
    mean_correlation <- mean_correlation + correlation$estimate
  }
  mean_correlation <- mean_correlation/(n - n_min + 1)
  return (mean_correlation)
}

run <- function(criterion, sign, file) {
  t_original <- read.table(input, header = TRUE)
  n <- nrow(t_original)

  cat("Generating", file,"\r\n")
  sink(file)
  cat("length correlation correlation_random p_value NA_counter\r\n")
  for (prefix_length in n_min:n) {
    t <- t_original
    f <- t$frequency
    d <- t$mean_duration
    D <- f*d
    t <- data.frame(f, d, D)
    NA_counter <- 0
    mean_true <- get_mean_correlation(t, prefix_length, criterion, sign) # this is the statistic of
the test
    correlation_random <- 0
    m <- 0
    for (i in 1:replicas) {
      repeat {
        d <- sample(t$d)

```

```
t <- data.frame(f=t$f, d, D=t$f*d)
mean_random <- get_mean_correlation(t, prefix_length, criterion, sign)
  if (is.na(mean_random)) {
    NA_counter <- NA_counter + 1
  } else {
    break
  }
}
if (two_sided) {
  increment <- abs(mean_random) > abs(mean_true)
} else {
  # one sided test
  increment <- mean_random < mean_true
}
if (increment) {
  m <- m + 1
}
p_value <- m/i
correlation_random <- correlation_random + mean_random
}
correlation_random <- correlation_random/replicas
cat(prefix_length, mean_true, correlation_random, p_value, NA_counter, "\r\n")
}
sink()
}

run("D", 1, "sorting_effect_test_total_d_ascending.txt")
run("f", 1, "sorting_effect_test_f_ascending.txt")
run("d", 1, "sorting_effect_test_mean_d_ascending.txt")

run("D", -1, "sorting_effect_test_total_d_descending.txt")
run("f", -1, "sorting_effect_test_f_descending.txt")
run("d", -1, "sorting_effect_test_mean_d_descending.txt")
```

S4

Mean duration and frequency of use (for each age class) of play gesture types. *S.D.* denotes standard deviation

Gesture Type	Mean	S.D.	Frequency	Nature	Infant	Juvenile	Subadult	Adult
Arm raise	1.07	0.34	11	Manual Gesture	1	7	3	0
Arm shake	3.29	2.29	18	Manual Gesture	1	10	7	0
Arm swing	2.03	1.34	137	Manual Gesture	20	85	32	0
Arm wave	1.61	0.92	3	Manual Gesture	0	2	1	0
Bite	3.46	2.47	66	Manual Gesture	14	31	18	3
Bow	2.06	1.10	2	Whole Body Signal	0	1	1	0
Clap	0.94	0.14	2	Manual Gesture	2	0	0	0
Dangle	6.14	5.59	229	Whole Body Signal	90	114	25	0
Directed push	12.72	0.00	1	Manual Gesture	0	0	1	0
Drum object	1.22	0.67	6	Manual Gesture	1	4	1	0
Drum other	1.53	0.81	4	Manual Gesture	1	3	0	0
Embrace	2.97	0.56	5	Manual Gesture	2	2	0	1
Feet shake	2.79	2.66	16	Manual Gesture	2	5	9	0
Gallop	3.81	2.02	23	Whole Body Signal	2	16	5	0
Grab	3.58	3.84	229	Manual Gesture	48	88	78	15
Grab-pull	3.59	2.37	44	Manual Gesture	4	13	24	3
Hand on	7.58	6.36	46	Manual Gesture	4	9	21	12
Hand shake	1.09	0.30	9	Manual Gesture	0	3	6	0
Head butt	1.60	0.00	1	Whole Body Signal	0	0	1	0
Head nod	3.02	3.75	17	Manual Gesture	0	4	11	2
Head stand	5.57	5.31	29	Whole Body Signal	1	14	13	1
Hide face	3.44	0.85	2	Manual Gesture	0	0	2	0
Hit with object	1.32	0.96	2	Manual Gesture	1	0	1	0
Jump	0.54	0.16	7	Whole Body Signal	3	2	2	0
Kick	0.87	0.57	73	Manual Gesture	7	11	55	0
Knock object	0.72	0.28	4	Manual Gesture	1	1	2	0
Leaf clipping	11.51	7.29	3	Manual Gesture	0	2	1	0
Leg swing	2.24	1.60	14	Manual Gesture	1	11	2	0
Look	1.60	0.00	1	Whole Body Signal	0	0	1	0
Object in mouth	6.95	4.70	27	Manual Gesture	11	14	2	0
Object move	2.00	1.50	97	Manual Gesture	25	37	34	1
Object shake	2.94	2.02	80	Manual Gesture	10	37	33	0
Pirouette	3.40	3.64	3	Whole Body Signal	1	2	0	0
Poke	1.21	0.65	10	Manual Gesture	0	3	5	2
Pounce	0.88	0.28	5	Whole Body Signal	0	3	2	0
Punch object/ground	0.58	0.34	25	Manual Gesture	12	10	2	1
Punch other	0.81	0.30	6	Manual Gesture	0	3	2	1
Push	2.18	3.14	10	Manual Gesture	2	4	4	0
Reach	3.24	2.68	66	Manual Gesture	18	21	22	5
Roll over	4.48	3.23	29	Whole Body Signal	1	16	11	1
Side roulade	3.08	1.92	9	Whole Body Signal	2	7	0	0
Slap object	0.69	0.53	128	Manual Gesture	14	74	40	0
Slap object with object	0.76	0.25	3	Manual Gesture	0	3	0	0
Slap other	0.86	2.86	158	Manual Gesture	82	66	9	1
Somersault	3.88	2.90	28	Whole Body Signal	10	11	7	0
Stiff walk	3.31	1.85	3	Whole Body Signal	0	1	2	0
Stomp	0.59	0.25	155	Manual Gesture	36	91	28	0
Stomp 2-feet	0.60	0.25	73	Manual Gesture	27	32	14	0
Stomp 2-feet alternate	2.07	0.93	23	Manual Gesture	7	12	4	0
Stomp 2-feet other	0.64	0.29	19	Manual Gesture	13	6	0	0
Stomp 2-feet other alternate	1.10	0.20	2	Manual Gesture	0	2	0	0
Stomp other	0.58	0.17	8	Manual Gesture	4	4	0	0
Tandem walk	2.04	0.00	1	Whole Body Signal	0	1	0	0
Tap object	0.43	0.13	5	Manual Gesture	0	5	0	0
Tap other	0.40	0.31	101	Manual Gesture	1	16	77	7
Throw object	3.06	3.14	2	Manual Gesture	0	2	0	0
Touch other	1.53	0.56	54	Manual Gesture	10	16	17	11
Water splash	17.19	7.21	3	Manual Gesture	0	3	0	0
58	2.85	1.87	2137	-	492	940	638	67

S5A**R Code for the calculation and significance testing of L**

```
data1 <- read.table ("DataL_processed.txt", header=T)

reps <- 100000

results <- rep(0, reps)

x <- c(data1$probability)
y <- c(data1$mean_duration)

L <- sum(x*y)

print (c("real L is", L))

sortvector <- 1:length(x)
for (i in 1:reps)
{
sortvector <- sample(sortvector, replace = F)
xtemp <- x[sortvector]
L_temp <- sum(xtemp *y)
results[i] <- L_temp
}
hist(results)

is_small <- sum(results < L)

print(c("P of being so small is estimated as ", is_small/reps))
```

S5B**R Code for the calculation and significance testing of M**

```
data1 <- read.table("DataM_sequence_1gesture.txt ", header=T)
reps <- 100000

results <- rep(0, reps)

x <- c(data1$Sequence_Size)
y <- c(data1$mean_duration)

M <- sum(x*y)

print(c("real M is", M))

sortvector <- 1:length(x)
for (i in 1:reps)
{
  sortvector <- sample(sortvector, replace = F)
  xtemp <- x[sortvector]
  M_temp <- sum(xtemp *y)
  results[i] <- M_temp
}
hist(results)

is_small <- sum(results < M)

print(c("P of being so small is estimated as ", is_small/reps))
```

Results of analyses of subsets of play gestures, ordered from low to high values of D , and from high to low values of D . Significant results are highlighted in grey. Values for L are indicated in seconds.

Order of gesture types				Spearman's correlation test for D				Spearman correlation tests for control analysis for D				L for D			
Gesture type (low to high D)	i (low to high D)	Gesture type (high to low D)	i (high to low D)	r_s (low to high D)	p	r_s (high to low D)	p	r_s (low to high D)	p	r_s (high to low D)	p	L (low to high D)	p	L (high to low D)	p
	0	Look	58	na	na	-0.01	0.97	na	na	0.86	<0.001	na	na	2.65	0.42
Look	1	Head butt	57	na	na	-0.01	0.93	na	na	0.85	<0.001	na	na	2.65	0.4
Head butt	2	Clap	56	na	na	-0.02	0.88	na	na	0.84	<0.001	na	na	2.65	0.39
Clap	3	Tandem walk	55	na	na	-0.04	0.79	na	na	0.84	<0.001	na	na	2.65	0.36
Tandem walk	4	Tap object	54	na	na	-0.04	0.78	na	0.73	0.83	<0.001	na	na	2.65	0.35
Tap object	5	Stomp 2-feet other alternate	53	-0.92	0.03	-0.06	0.68	0.69	0.2	0.84	<0.001	0.93	<0.001	2.65	0.32
Stomp 2-feet other alternate	6	Slap object with object	52	-0.94	0.01	-0.08	0.6	0.69	0.13	0.83	<0.001	0.96	<0.001	2.66	0.3
Slap object with object	7	Hit with object	51	-0.96	<0.001	-0.1	0.5	0.74	0.06	0.83	<0.001	0.92	<0.001	2.66	0.27
Hit with object	8	Knock object	50	-0.96	<0.001	-0.11	0.43	0.66	0.08	0.82	<0.001	0.96	<0.001	2.66	0.25
Knock object	9	Jump	49	-0.97	<0.001	-0.13	0.37	0.69	0.04	0.82	<0.001	0.92	<0.001	2.66	0.22
Jump	10	Bow	48	-0.97	<0.001	-0.16	0.28	0.78	0.01	0.82	<0.001	0.82	<0.001	2.67	0.19
Bow	11	Pounce	47	-0.86	<0.01	-0.17	0.26	0.65	0.03	0.82	<0.001	0.91	<0.001	2.67	0.18
Pounce	12	Stomp other	46	-0.86	<0.001	-0.18	0.23	0.69	0.01	0.82	<0.001	0.9	<0.001	2.67	0.15
Stomp other	13	Punch other	45	-0.87	<0.001	-0.22	0.16	0.76	<0.01	0.82	<0.001	0.84	<0.001	2.68	0.13
Punch other	14	Arm wave	44	-0.85	<0.001	-0.24	0.12	0.79	<0.01	0.82	<0.001	0.84	<0.001	2.68	0.11

Order of gesture types			Spearman's correlation test for D				Spearman correlation tests for control analysis for D				L for D				
Gesture type (low to high D)	i (low to high D)	Gesture type (high to low D)	i (high to low D)	r_s (low to high D)	p	r_s (high to low D)	p	r_s (low to high D)	p	r_s (high to low D)	p	L (low to high D)	p	L (high to low D)	p
Arm wave	15	Throw object	43	-0.79	<0.001	-0.26	0.09	0.73	<0.01	0.81	<0.001	0.88	<0.001	2.68	0.09
Throw object	16	Drum other	42	-0.77	<0.001	-0.26	0.1	0.6	0.02	0.8	<0.001	0.96	<0.001	2.69	0.09
Drum other	17	Hide face	41	-0.76	<0.001	-0.28	0.08	0.57	0.02	0.79	<0.001	1	<0.001	2.69	0.07
Hide face	18	Drum object (palms)	40	-0.74	<0.001	-0.27	0.09	0.47	0.05	0.78	<0.001	1.1	<0.001	2.69	0.08
Drum object (palms)	19	Hand shake	39	-0.71	<0.01	-0.3	0.07	0.52	0.02	0.77	<0.001	1.1	<0.001	2.69	0.06
Hand shake	20	Stiff walk	38	-0.68	<0.01	-0.32	0.05	0.59	0.01	0.77	<0.001	1.1	<0.01	2.7	0.05
Stiff walk	21	Pirouette	37	-0.64	<0.01	-0.32	0.06	0.54	0.01	0.75	<0.001	1.18	<0.01	2.7	0.05
Pirouette	22	Arm raise	36	-0.61	<0.01	-0.31	0.06	0.5	0.02	0.73	0.003	1.26	<0.01	2.7	0.05
Arm raise	23	Poke	35	-0.6	<0.01	-0.34	0.04	0.56	0.01	0.72	0.009	1.24	<0.01	2.71	0.03
Poke	24	Stomp 2-feet other	34	-0.57	<0.01	-0.38	0.03	0.62	<0.01	0.71	<0.001	1.24	<0.01	2.72	0.02
Stomp 2-feet other	25	Directed push	33	-0.61	<0.01	-0.42	0.02	0.66	<0.001	0.71	<0.001	1.14	<0.01	2.74	0.02
Directed push	26	Punch object/ground	32	-0.65	<0.001	-0.36	0.04	0.45	0.01	0.68	<0.001	1.24	<0.001	2.73	0.04
Punch object/ground	27	Embrace	31	-0.67	<0.001	-0.41	0.02	0.55	<0.01	0.68	<0.001	1.13	<0.001	2.76	0.03
Embrace	28	Push	30	-0.64	<0.001	-0.43	0.02	0.55	<0.01	0.65	<0.001	1.19	<0.001	2.76	0.02
Push	29	Side roulade	29	-0.56	<0.01	-0.46	0.01	0.59	<0.01	0.62	<0.001	1.25	<0.001	2.76	0.02
Side roulade	30	Leg swing	28	-0.48	<0.01	-0.48	0.01	0.61	<0.001	0.58	<0.01	1.34	<0.01	2.76	0.01
Leg swing	31	Leaf clipping	27	-0.41	0.02	-0.52	<0.01	0.65	<0.001	0.54	<0.01	1.41	<0.001	2.76	0.01
Leaf clipping	32	Tap other	26	-0.42	0.02	-0.46	0.02	0.59	<0.001	0.49	0.01	1.57	0.01	2.75	0.03

Order of gesture types			Spearman's correlation test for D				Spearman correlation tests for control analysis for D				L for D				
Gesture type (low to high D)	i (low to high D)	Gesture type (high to low D)	i (high to low D)	r_s (low to high D)	p	r_s (high to low D)	p	r_s (low to high D)	p	r_s (high to low D)	p	L (low to high D)	p	L (high to low D)	p
Tap other	33	Stomp 2-feet	25	-0.47	0.01	-0.43	0.03	0.63	<0.001	0.59	<0.01	1.16	<0.001	2.88	0.04
Stomp 2-feet	34	Feet shake	24	-0.5	<0.01	-0.41	0.05	0.66	<0.001	0.68	<0.001	1.05	<0.001	2.97	0.04
Feet shake	35	Stomp 2-feet alternate	23	-0.45	<0.01	-0.46	0.03	0.63	<0.001	0.63	<0.01	1.12	<0.001	2.97	0.03
Stomp 2-feet alternate	36	Head nod	22	-0.41	0.01	-0.51	0.02	0.7	<0.001	0.59	<0.01	1.18	<0.01	2.98	0.03
Head nod	37	Water splash. 1 hand	21	-0.36	0.03	-0.56	0.01	0.72	0.01	0.53	0.01	1.25	<0.01	2.98	0.02
Water splash, 1 hand	38	Arm shake	20	-0.37	0.02	-0.5	0.03	0.66	<0.001	0.46	0.04	1.37	<0.01	2.96	0.13
Arm shake	39	Kick	19	-0.33	0.04	-0.54	0.02	0.68	<0.001	0.37	0.12	1.45	<0.01	2.96	0.13
Kick	40	Touch other	18	-0.36	0.02	-0.53	0.02	0.7	0.01	0.42	0.08	1.36	<0.01	3.05	0.11
Touch other	41	Gallop	17	-0.35	0.02	-0.55	0.02	0.72	<0.01	0.44	0.08	1.38	<0.01	3.1	0.08
Gallop	42	Slap object	16	-0.3	0.06	-0.55	0.03	0.73	<0.001	0.32	0.22	1.47	<0.01	3.09	0.09
Slap object	43	Stomp	15	-0.34	0.03	-0.54	0.04	0.75	<0.001	0.44	0.1	1.33	<0.01	3.31	0.11
Stomp	44	Somersault	14	-0.37	0.01	-0.53	0.06	0.77	<0.001	0.64	0.01	1.2	<0.01	3.64	0.18
Somersault	45	Roll over	13	-0.32	0.03	-0.51	0.07	0.78	<0.001	0.58	0.04	1.29	<0.01	3.64	0.18
Roll over	46	Slap other	12	-0.27	0.07	-0.48	0.11	0.79	<0.001	0.51	0.09	1.38	<0.01	3.62	0.19
Slap other	47	Grab-pull	11	-0.3	0.04	-0.47	0.15	0.8	<0.001	0.77	0.01	1.31	<0.01	4.03	0.31
Grab-pull	48	Head stand	10	-0.26	0.08	-0.43	0.22	0.81	<0.001	0.73	0.02	1.4	<0.01	4.05	0.28
Head stand	49	Object in mouth	9	-0.22	0.13	-0.37	0.33	0.81	<0.001	0.64	0.06	1.5	<0.01	4	0.35
Object in mouth	50	Object move	8	-0.18	0.2	-0.12	0.78	0.82	<0.001	0.48	0.23	1.63	0.01	3.92	0.55
Object move	51	Reach	7	-0.18	0.21	-0.11	0.82	0.82	<0.001	0.62	0.14	1.65	0.02	4.14	0.5

Order of gesture types				Spearman's correlation test for D				Spearman correlation tests for control analysis for D				L for D			
Gesture type (low to high D)	i (low to high D)	Gesture type (high to low D)	i (high to low D)	r_s (low to high D)	p	r_s (high to low D)	p	r_s (low to high D)	p	r_s (high to low D)	p	L (low to high D)	p	L (high to low D)	p
Reach	52	Bite	6	-0.16	0.27	-0.12	0.83	0.83	<0.001	0.64	0.173	1.73	0.02	4.21	0.44
Bite	53	Object shake	5	-0.13	0.36	-0.15	0.81	0.83	<0.001	0.67	0.22	1.81	0.03	4.28	0.37
Object shake	54	Arm swing	4	-0.11	0.41	na	na	0.84	<0.001	na	na	1.87	0.04	na	na
Arm swing	55	Hand on	3	-0.11	0.43	na	na	0.84	<0.001	na	na	1.89	0.04	na	na
Hand on	56	Grab	2	-0.09	0.52	na	na	0.84	<0.001	na	na	2.04	0.07	na	na
Grab	57	Dangle	1	-0.05	0.73	na	na	0.85	<0.001	na	na	2.23	0.16	na	na
Dangle	58		0	-0.01	0.97	na	na	0.86	<0.001	na	na	2.65	0.42	na	na

Results of analyses of subsets of play gestures, ordered from low to high values of f , and from high to low values of f . Significant results are highlighted in grey. Values for L are indicated in seconds.

Order of gesture types				Spearman's correlation test for f				Spearman correlation tests for control analysis for f				L for f			
Gesture type (low to high f)	i (low to high f)	Gesture type (high to low f)	i (high to low f)	r_s (low to high f)	p	r_s (high to low f)	p	r_s (low to high f)	p	r_s (high to low f)	p	L (low to high f)	p	L (high to low f)	p
	0	Look	58	na	na	-0.01	0.97	na	na	0.86	<0.001	na	na	2.65	0.42
Look	1	Head butt	57	na	na	0.04	0.742	na	na	0.85	<0.001	na	na	2.65	0.41
Head butt	2	Tandem walk	56	na	na	0.05	0.736	na	na	0.84	<0.001	na	na	2.65	0.39
Tandem walk	3	Directed push	55	na	na	0.04	0.772	na	na	0.84	<0.001	na	na	2.65	0.38
Directed push	4	Clap	54	na	na	0.03	0.81	na	na	0.85	<0.001	na	na	2.64	0.5
Clap	5	Stomp 2-feet other alternate	53	-0.73	0.17	0.06	0.691	na	na	0.84	<0.001	3.31	<0.001	2.64	0.47
Stomp 2-feet other alternate	6	Hit with object	52	-0.84	0.04	0.07	0.611	0.21	0.69	0.84	<0.001	2.76	<0.001	2.65	0.45
Hit with object	7	Bow	51	-0.87	0.01	0.07	0.602	0.29	0.53	0.83	<0.001	2.47	<0.001	2.65	0.43
Bow	8	Throw object	50	-0.55	0.16	0.06	0.657	0.33	0.43	0.82	<0.001	2.4	0.06	2.65	0.41
Throw object	9	Hide face	49	-0.35	0.36	0.05	0.734	0.35	0.36	0.82	<0.001	2.49	0.19	2.65	0.42
Hide face	10	Slap object with object	48	-0.21	0.55	0.03	0.84	0.36	0.31	0.82	<0.001	2.61	0.25	2.65	0.43
Slap object with object	11	Arm wave	47	-0.43	0.18	0.09	0.537	0.31	0.36	0.81	<0.001	2.32	0.11	2.65	0.4
Arm wave	12	Stiff walk	46	-0.34	0.27	0.16	0.288	0.33	0.30	0.81	<0.001	2.22	0.1	2.65	0.37
Stiff walk	13	Pirouette	45	-0.17	0.58	0.19	0.2	0.40	0.18	0.81	<0.001	2.35	0.17	2.65	0.39
Pirouette	14	Leaf clipping	44	-0.05	0.87	0.23	0.129	0.45	0.11	0.80	<0.001	2.47	0.22	2.65	0.4
Leaf clipping	15	Water splash. 1 hand	43	0.07	0.81	0.23	0.13	0.52	0.05	0.82	<0.001	3.34	0.48	2.64	0.54
Water splash, 1 hand	16	Knock object	42	0.19	0.49	0.21	0.18	0.58	0.02	0.85	<0.001	4.56	0.75	2.61	0.81

Order of gesture types				Spearman's correlation test for f				Spearman correlation tests for control analysis for f				L for f			
Gesture type (low to high f)	i (low to high f)	Gesture type (high to low f)	i (high to low f)	r_s (low to high f)	p	r_s (high to low f)	p	r_s (low to high f)	p	r_s (high to low f)	p	L (low to high f)	p	L (high to low f)	p
Knock object	17	Drum other	41	-0.21	0.94	0.21	0.187	0.50	0.04	0.84	<0.001	4.16	0.61	2.62	0.78
Drum other	18	Tap object	40	-0.11	0.67	0.18	0.25	0.47	0.05	0.83	<0.001	3.91	0.53	2.62	0.76
Tap object	19	Pounce	39	-0.25	0.31	0.21	0.2	0.35	0.14	0.82	<0.001	3.54	0.39	2.63	0.72
Pounce	20	Embrace	38	-0.35	0.14	0.2	0.237	0.32	0.17	0.81	<0.001	3.28	0.3	2.63	0.69
Embrace	21	Punch other	37	-0.27	0.23	0.14	0.42	0.38	0.09	0.81	<0.001	3.26	0.3	2.63	0.7
Punch other	22	Drum object (palms)	36	-0.35	0.11	0.12	0.476	0.36	0.10	0.79	<0.001	3.02	0.22	2.63	0.66
Drum object (palms)	23	Jump	35	-0.38	0.07	0.09	0.62	0.38	0.08	0.77	<0.001	2.87	0.18	2.64	0.62
Jump	24	Stomp other	34	-0.46	0.03	0.01	0.95	0.33	0.12	0.75	<0.001	2.65	0.13	2.65	0.56
Stomp other	25	Hand shake	33	-0.52	0.01	-0.07	0.7	0.30	0.14	0.73	<0.001	2.45	0.08	2.65	0.5
Hand shake	26	Side roulade	32	-0.53	0.01	-0.06	0.741	0.33	0.10	0.7	<0.001	2.32	0.06	2.66	0.45
Side roulade	27	Poke	31	-0.43	0.03	-0.1	0.6	0.38	0.05	0.68	<0.001	2.39	0.09	2.66	0.46
Poke	28	Push	30	-0.43	0.02	-0.11	0.581	0.41	0.03	0.65	<0.001	2.28	0.07	2.67	0.41
Push	29	Arm raise	29	-0.36	0.05	-0.15	0.45	0.45	0.01	0.62	<0.001	2.28	0.08	2.67	0.39
Arm raise	30	Leg swing	28	-0.39	0.04	-0.20	0.32	0.47	0.01	0.58	<0.01	2.18	0.06	2.67	0.32
Leg swing	31	Feet shake	27	-0.32	0.08	-0.21	0.29	0.51	0.00	0.54	<0.01	2.18	0.07	2.68	0.3
Feet shake	32	Head nod	26	-0.26	0.15	-0.23	0.27	0.55	0.00	0.52	0.01	2.24	0.1	2.68	0.3
Head nod	33	Arm shake	25	-0.21	0.25	-0.23	0.27	0.58	<0.001	0.49	0.01	2.31	0.15	2.68	0.31
Arm shake	34	Stomp 2-feet other	24	-0.14	0.42	-0.22	0.29	0.62	<0.001	0.46	0.03	2.4	0.2	2.67	0.32
Stomp 2-feet other	35	Stomp 2-feet alternate	23	-0.21	0.24	-0.34	0.12	0.62	<0.001	0.38	0.07	2.25	0.14	2.69	0.24
Stomp 2-feet alternate	36	Gallop	22	-0.17	0.33	-0.3	0.175	0.64	<0.001	0.33	0.13	2.23	0.14	2.7	0.21
Gallop	37	Punch object/ground	21	-0.1	0.58	-0.33	0.15	0.67	<0.001	0.29	0.2	2.37	0.22	2.68	0.24

Order of gesture types				Spearman's correlation test for f				Spearman correlation tests for control analysis for f				L for f			
Gesture type (low to high f)	i (low to high f)	Gesture type (high to low f)	i (high to low f)	r_s (low to high f)	p	r_s (high to low f)	p	r_s (low to high f)	p	r_s (high to low f)	p	L (low to high f)	p	L (high to low f)	p
Punch object/ground	38	Object in mouth	20	-0.16	0.35	-0.51	0.02	0.67	<0.001	0.18	0.45	2.21	0.15	2.71	0.15
Object in mouth	39	Somersault	19	-0.09	0.60	-0.44	0.06	0.69	<0.001	0.21	0.39	2.62	0.37	2.65	0.27
Somersault	40	Roll over	18	-0.02	0.88	-0.39	0.11	0.72	<0.001	0.20	0.43	2.72	0.42	2.63	0.32
Roll over	41	Head stand	17	0.03	0.84	-0.33	0.20	0.74	<0.001	0.19	0.47	2.86	0.5	2.6	0.41
Head stand	42	Grab-pull	16	0.08	0.60	-0.25	0.36	0.75	<0.001	0.22	0.42	3.06	0.59	2.55	0.58
Grab-pull	43	Hand on	15	0.13	0.41	-0.14	0.62	0.77	<0.001	0.25	0.36	3.11	0.62	2.52	0.64
Hand on	44	Touch other	14	0.17	0.26	0.06	0.83	0.79	<0.001	0.42	0.13	3.53	0.8	2.38	0.92
Touch other	45	Reach	13	0.15	0.33	0.06	0.84	0.80	<0.001	0.36	0.23	3.33	0.71	2.41	0.91
Reach	46	Bite	12	0.17	0.26	0.19	0.56	0.81	<0.001	0.48	0.12	3.32	0.7	2.32	0.94
Bite	47	Stomp 2-feet	11	0.2	0.17	0.36	0.28	0.82	<0.001	0.64	0.03	3.33	0.71	2.33	0.97
Stomp 2-feet	48	Kick	10	0.14	0.35	0.43	0.22	0.82	<0.001	0.57	0.08	3.07	0.58	2.42	0.96
Kick	49	Object shake	9	0.09	0.54	0.36	0.34	0.82	<0.001	0.46	0.21	2.87	0.48	2.5	0.94
Object shake	50	Object move	8	0.1	0.48	0.59	0.13	0.83	<0.001	0.64	0.09	2.88	0.48	2.47	0.97
Object move	51	Tap other	7	0.1	0.50	0.81	0.03	0.84	<0.001	0.88	0.01	2.79	0.43	2.52	0.98
Tap other	52	Slap object	6	0.04	0.81	0.70	0.13	0.83	<0.001	0.81	0.05	2.57	0.3	2.72	0.96
Slap object	53	Arm swing	5	-0.01	0.93	0.67	0.22	0.83	<0.001	0.67	0.22	2.38	0.2	2.67	0.95
Arm swing	54	Stomp	4	-0.01	0.94	na	na	0.84	<0.001	na	na	2.34	0.19	na	na
Stomp	55	Slap other	3	-0.06	0.69	na	na	0.84	<0.001	na	na	2.164	0.11	na	na

Order of gesture types				Spearman's correlation test for f				Spearman correlation tests for control analysis for f				L for f			
Gesture type (low to high f)	i (low to high f)	Gesture type (high to low f)	i (high to low f)	r_s (low to high f)	p	r_s (high to low f)	p	r_s (low to high f)	p	r_s (high to low f)	p	L (low to high f)	p	L (high to low f)	p
Slap other	56	Grab	2	-0.09	0.52	na	na	0.84	<0.001	na	na	2.04	0.07	na	na
Grab	57	Dangle	1	-0.05	0.73	na	na	0.85	<0.001	na	na	2.23	0.16	na	na
Dangle	58		0	-0.01	0.97	na	na	0.86	<0.001	na	na	2.65	0.42	na	na

Results of analyses of subsets of play gestures, ordered from low to high values of d , and from high to low values of d . Significant results are highlighted in grey. Values for L are indicated in seconds.

Order of gesture types				Spearman's correlation test for d				Spearman correlation tests for control analysis for d				L for d			
Gesture type (low to high d)	i (low to high d)	Gesture type (high to low d)	i (high to low d)	r_s (low to high d)	p	r_s high to low d	p	r_s (low to high d)	p	r_s (high to low d)	p	L (low to high d)	p	L (high to low d)	p
	0	Tap other	58	na	na	-0.01	0.97	na	na	0.86	<0.001	na	na	2.65	0.42
Tap other	1	Tap object	57	na	na	0.04	0.78	na	na	0.87	<0.001	na	na	2.76	0.48
Tap object	2	Jump	56	na	na	0.03	0.85	na	na	0.87	<0.001	na	na	2.76	0.45
Jump	3	Stomp other	55	na	na	0.01	0.92	na	na	0.88	<0.001	na	na	2.77	0.42
Stomp other	4	Punch object/ground	54	na	na	0.00	0.98	na	na	0.88	<0.001	na	na	2.77	0.42
Punch object/ground	5	Stomp	53	-0.05	0.94	0.02	0.91	1	0.02	0.88	<0.001	0.45	0.23	2.78	0.4
Stomp	6	Stomp 2-feet	52	0.41	0.43	0.07	0.64	1	<0.001	0.89	<0.001	0.52	0.52	2.81	0.39
Stomp 2-feet	7	Stomp 2-feet other	51	0.38	0.40	0.12	0.42	0.96	<0.001	0.90	<0.001	0.54	0.54	3.1	0.53
Stomp 2-feet other	8	Slap object	50	0.26	0.53	0.13	0.37	0.98	<0.001	0.90	<0.001	0.54	0.44	3.12	0.52
Slap object	9	Knock object	49	0.44	0.24	0.19	0.20	0.98	<0.001	0.90	<0.001	0.58	0.69	3.31	0.6
Knock object	10	Slap object with object	48	0.04	0.91	0.18	0.22	0.98	<0.001	0.91	<0.001	0.58	0.69	3.32	0.57
Slap object with object	11	Punch other	47	-0.22	0.52	0.16	0.29	0.96	<0.001	0.91	<0.001	0.58	0.69	3.32	0.55
Punch other	12	Slap other	46	-0.31	0.33	0.15	0.31	0.95	<0.001	0.92	<0.001	0.58	0.69	3.33	0.52
Slap other	13	Kick	45	-0.03	0.93	0.22	0.14	0.96	<0.001	0.92	<0.001	0.65	0.64	3.6	0.64
Kick	14	Pounce	44	0.04	0.88	0.29	0.06	0.96	<0.001	0.92	<0.001	0.67	0.68	3.75	0.68
Pounce	15	Clap	43	-0.10	0.73	0.29	0.06	0.95	<0.001	0.93	<0.001	0.67	0.55	3.76	0.66

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Clap	16	Arm raise	42	-0.26	0.34	0.26	0.10	0.96	<0.001	0.93	<0.001	0.67	0.41	3.76	0.63
Arm raise	17	Hand shake	41	-0.23	0.38	0.26	0.10	0.97	<0.001	0.93	<0.001	0.68	0.31	3.78	0.61
Hand shake	18	Stomp 2-feet other alternate	40	-0.20	0.42	0.26	0.10	0.97	<0.001	0.94	<0.001	0.68	0.23	3.8	0.59
Stomp 2-feet other alternate	19	Poke	39	-0.32	0.18	0.22	0.17	0.97	<0.001	0.93	<0.001	0.68	0.16	3.81	0.56
Poke	20	Drum object (palms)	38	-0.28	0.23	0.22	0.18	0.97	<0.001	0.94	<0.001	0.69	0.12	3.83	0.54
Drum object (palms)	21	Hit with object	37	-0.31	0.18	0.22	0.20	0.97	<0.001	0.94	<0.001	0.69	0.09	3.84	0.5
Hit with object	22	Drum other	36	-0.39	0.07	0.17	0.32	0.96	<0.001	0.94	<0.001	0.69	0.06	3.84	0.46
Drum other	23	Touch other	35	-0.44	0.04	0.16	0.37	0.95	<0.001	0.95	<0.001	0.7	0.04	3.85	0.45
Touch other	24	Look	34	-0.35	0.09	0.23	0.20	0.95	<0.001	0.95	<0.001	0.75	0.08	3.95	0.45
Look	25	Head butt	33	-0.43	0.03	0.16	0.37	0.95	<0.001	0.95	<0.001	0.75	0.06	3.95	0.41
Head butt	26	Arm wave	32	-0.49	0.01	0.09	0.64	0.96	<0.001	0.95	<0.001	0.75	0.06	3.95	0.36
Arm wave	27	Object move	31	-0.52	0.01	0.04	0.83	0.94	<0.001	0.95	<0.001	0.75	0.03	3.96	0.32
Object move	28	Arm swing	30	-0.41	0.03	0.13	0.50	0.94	<0.001	0.95	<0.001	0.88	0.16	4.12	0.39
Arm swing	29	Tandem walk	29	-0.29	0.13	0.23	0.24	0.95	<0.001	0.95	<0.001	1.02	0.49	4.4	0.51
Tandem walk	30	Bow	28	-0.36	0.05	0.15	0.45	0.95	<0.001	0.95	<0.001	1.02	0.38	4.4	0.46
Bow	31	Stomp 2-feet alternate	27	-0.41	0.02	0.07	0.72	0.94	<0.001	0.94	<0.001	1.02	0.38	4.41	0.41
Stomp 2-feet alternate	32	Push	26	-0.35	0.05	0.07	0.73	0.94	<0.001	0.95	<0.001	1.04	0.28	4.46	0.39
Push	33	Leg swing	25	-0.31	0.08	0.05	0.81	0.95	<0.001	0.95	<0.001	1.05	0.23	4.48	0.35
Leg swing	34	Feet shake	24	-0.27	0.13	0.02	0.91	0.95	<0.001	0.95	<0.001	1.07	0.21	4.51	0.32

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Foot shake	35	Object shake	23	-0.23	0.18	-0.01	0.98	0.95	<0.001	0.95	<0.001	1.09	0.18	4.54	0.29
Object shake	36	Embrace	22	-0.16	0.34	0.10	0.64	0.95	<0.001	0.95	<0.001	1.21	0.34	4.7	0.35
Embrace	37	Head nod	21	-0.18	0.28	0.08	0.74	0.93	<0.001	0.95	<0.001	1.22	0.26	4.7	0.3
Head nod	38	Throw object	20	-0.15	0.36	0.05	0.84	0.93	<0.001	0.95	<0.001	1.24	0.24	4.73	0.28
Throw object	39	Side roulade	19	-0.20	0.21	-0.07	0.77	0.92	<0.001	0.95	<0.001	1.24	0.18	4.74	0.22
Side roulade	40	Reach	18	-0.19	0.25	-0.13	0.60	0.92	<0.001	0.95	<0.001	1.26	0.15	4.75	0.18
Reach	41	Arm shake	17	-0.14	0.38	-0.02	0.94	0.92	<0.001	0.94	<0.001	1.35	0.23	4.88	0.22
Arm shake	42	Stiff walk	16	-0.12	0.46	-0.07	0.79	0.92	<0.001	0.93	<0.001	1.38	0.2	4.92	0.19
Stiff walk	43	Pirouette	15	-0.15	0.33	-0.20	0.49	0.91	<0.001	0.94	<0.001	1.38	0.16	4.92	0.13
Pirouette	44	Hide face	14	-0.19	0.23	-0.35	0.22	0.91	<0.001	0.94	<0.001	1.39	0.13	4.93	0.08
Hide face	45	Bite	13	-0.23	0.14	-0.63	0.02	0.90	<0.001	0.93	<0.001	1.39	0.1	4.93	0.04
Bite	46	Grab	12	-0.18	0.23	-0.58	0.05	0.90	<0.001	0.91	<0.001	1.48	0.15	5.07	0.05
Grab	47	Grab-pull	11	-0.11	0.48	-0.48	0.14	0.90	<0.001	0.89	<0.001	1.77	0.55	5.82	0.15
Grab-pull	48	Gallop	10	-0.74	0.62	-0.45	0.19	0.90	<0.001	0.92	<0.001	1.82	0.57	6.05	0.16
Gallop	49	Somersault	9	-0.49	0.74	-0.60	0.09	0.91	<0.001	0.89	<0.01	1.84	0.54	6.18	0.12
Somersault	50	Roll over	8	-0.02	0.88	-0.69	0.06	0.91	<0.001	0.92	<0.01	1.88	0.53	6.36	0.07
Roll over	51	Head stand	7	0.01	0.98	-0.76	0.05	0.91	<0.001	0.96	<0.001	1.92	0.51	6.52	0.02
Head stand	52	Dangle	6	0.03	0.84	-0.84	0.04	0.90	<0.001	0.99	<0.001	1.98	0.5	6.61	0.01
Dangle	53	Object in mouth	5	0.08	0.56	-0.72	0.17	0.91	<0.001	0.98	0.01	2.44	0.91	7.94	0.07
Object in mouth	54	Hand on	4	0.10	0.47	na	na	0.91	<0.001	na	na	2.5	0.87	na	na
Hand on	55	Leaf clipping	3	0.12	0.39	na	na	0.90	<0.001	na	na	2.61	0.86	na	na

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Leaf clipping	56	Directed push	2	0.08	0.56	na	na	0.89	<0.001	na	na	2.62	0.72	na	na
Directed push	57	Water splash, 1 hand	1	0.03	0.84	na	na	0.88	<0.001	na	na	2.63	0.57	na	na
Water splash, 1 hand	58		0	-0.01	0.97	na	na	0.86	<0.001	na	na	2.65	0.42	na	na

References of the Electronic Supplementary Material

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