

Cross Correlation Analysis

Series X: G1

Series Y: G3

Lag convention: positive lag means X<sub>t</sub> is compared with Y<sub>(t+lag)</sub>.

Series summary:

series	n	mean	standard_deviation	minimum	q1	median	q3	maximum
G1	649	11.39908	2.745265	0	10	11	13	19
G3	649	11.90601	3.230656	0	10	12	14	19

Result summary:

result_item	lag	r	p_value	interpretation
Lag 0 correlation	0	0.8263871	1.617571e-163	Same-row / no lag correlation
Strongest absolute cross-correlation	0	0.8263871	1.617571e-163	Same-row / no lag correlation

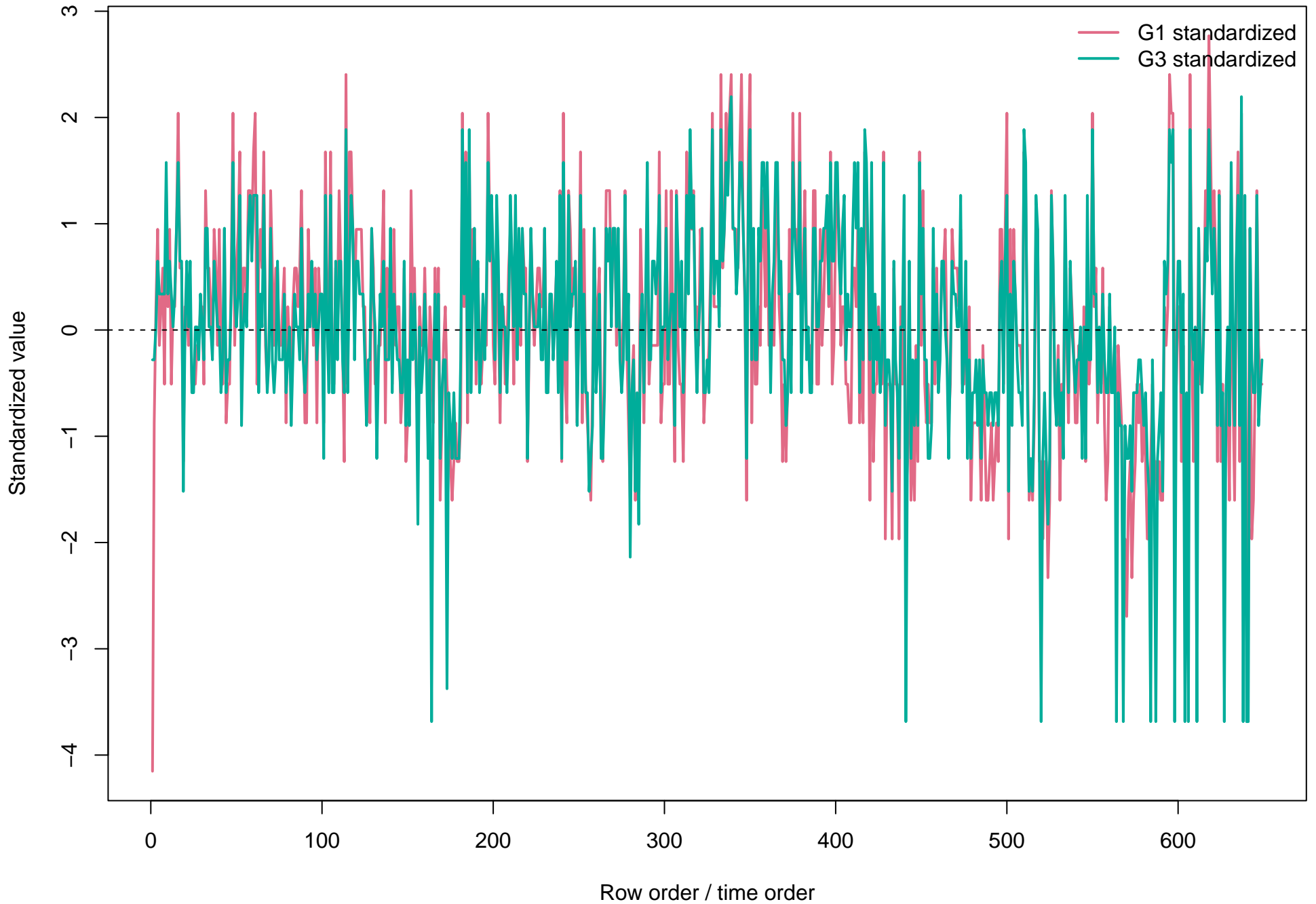
Top cross-correlation rows:

lag	pair_n	cross_correlation_r	t_statistic	p_value_two_tailed	ci95_lower	ci95_upper	approx_95_band
0	649	0.8263871	37.329167	1.617571e-163	0.80032646	0.8493311	0.07693673
-2	647	0.2537455	6.662391	5.779680e-11	0.18018961	0.3244793	0.07705555
2	647	0.2280251	5.947814	4.455435e-09	0.15364543	0.2998354	0.07705555
-3	646	0.2119930	5.504899	5.338968e-08	0.13709504	0.2844807	0.07711517
1	648	0.1996434	5.178493	2.992007e-07	0.12453773	0.2724743	0.07699607
-1	648	0.1940145	5.026688	6.470112e-07	0.11876856	0.2670446	0.07699607
-6	643	0.1825607	4.701072	3.170104e-06	0.10674781	0.2562632	0.07729485
-5	644	0.1789428	4.608384	4.896689e-06	0.10310862	0.2527087	0.07723482
-4	645	0.1715979	4.416798	1.175208e-05	0.09566551	0.2455448	0.07717492
11	638	0.1530511	3.905819	1.039535e-04	0.07633564	0.2279652	0.07759714

outside_approx_95_band	lag_direction	interpretation	absolute_correlation
TRUE	Same-row /	no lag correlation	0.8263871
TRUE	G3 leads	G1 by 2 row(s)	0.2537455
TRUE	G1 leads	G3 by 2 row(s)	0.2280251
TRUE	G3 leads	G1 by 3 row(s)	0.2119930
TRUE	G1 leads	G3 by 1 row(s)	0.1996434
TRUE	G3 leads	G1 by 1 row(s)	0.1940145
TRUE	G3 leads	G1 by 6 row(s)	0.1825607
TRUE	G3 leads	G1 by 5 row(s)	0.1789428
TRUE	G3 leads	G1 by 4 row(s)	0.1715979
TRUE	G1 leads	G3 by 11 row(s)	0.1530511

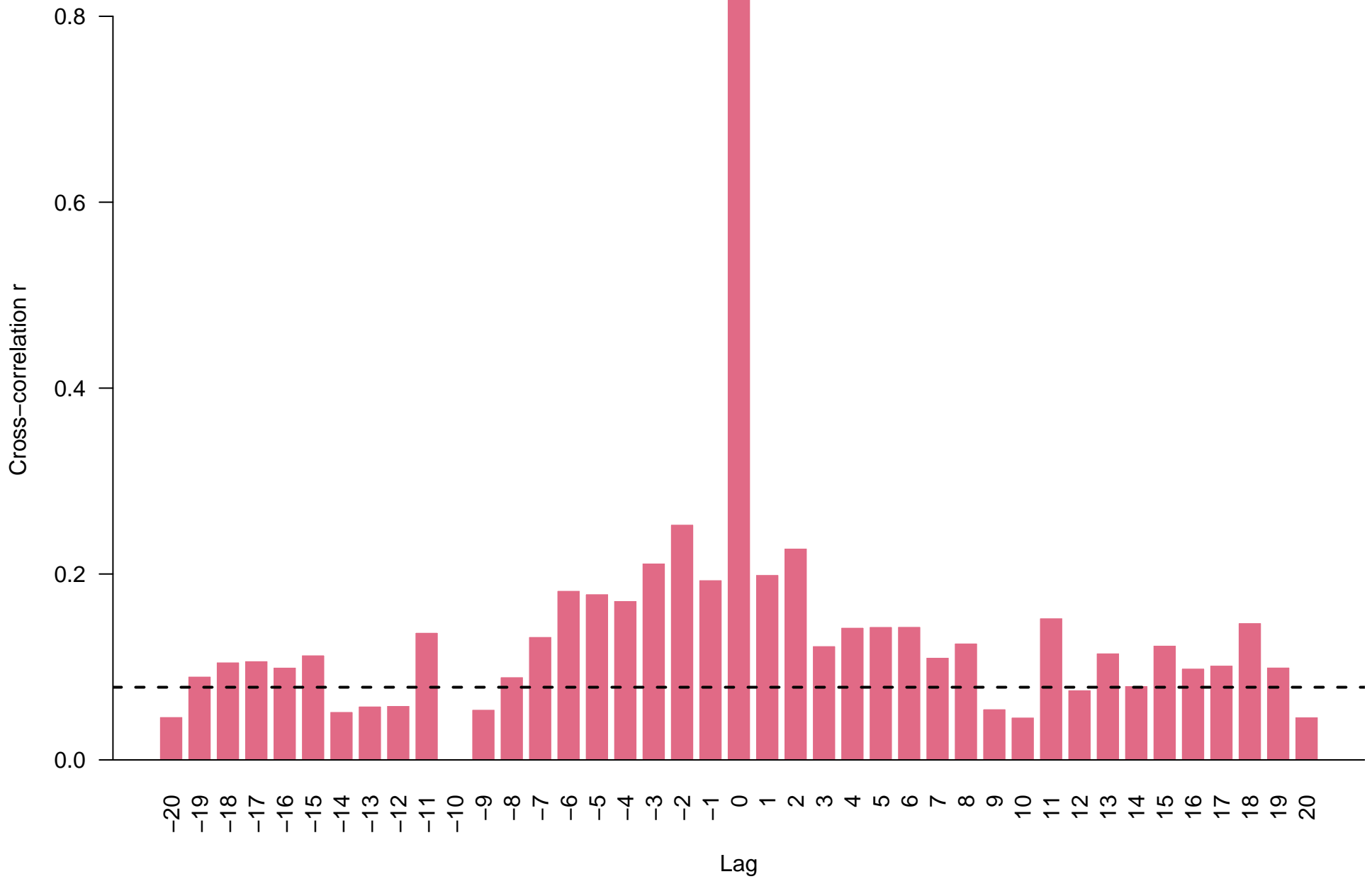
# Cross Correlation: Colorful Ordered Series Profile

Standardized series make timing pattern and co-movement easier to compare.



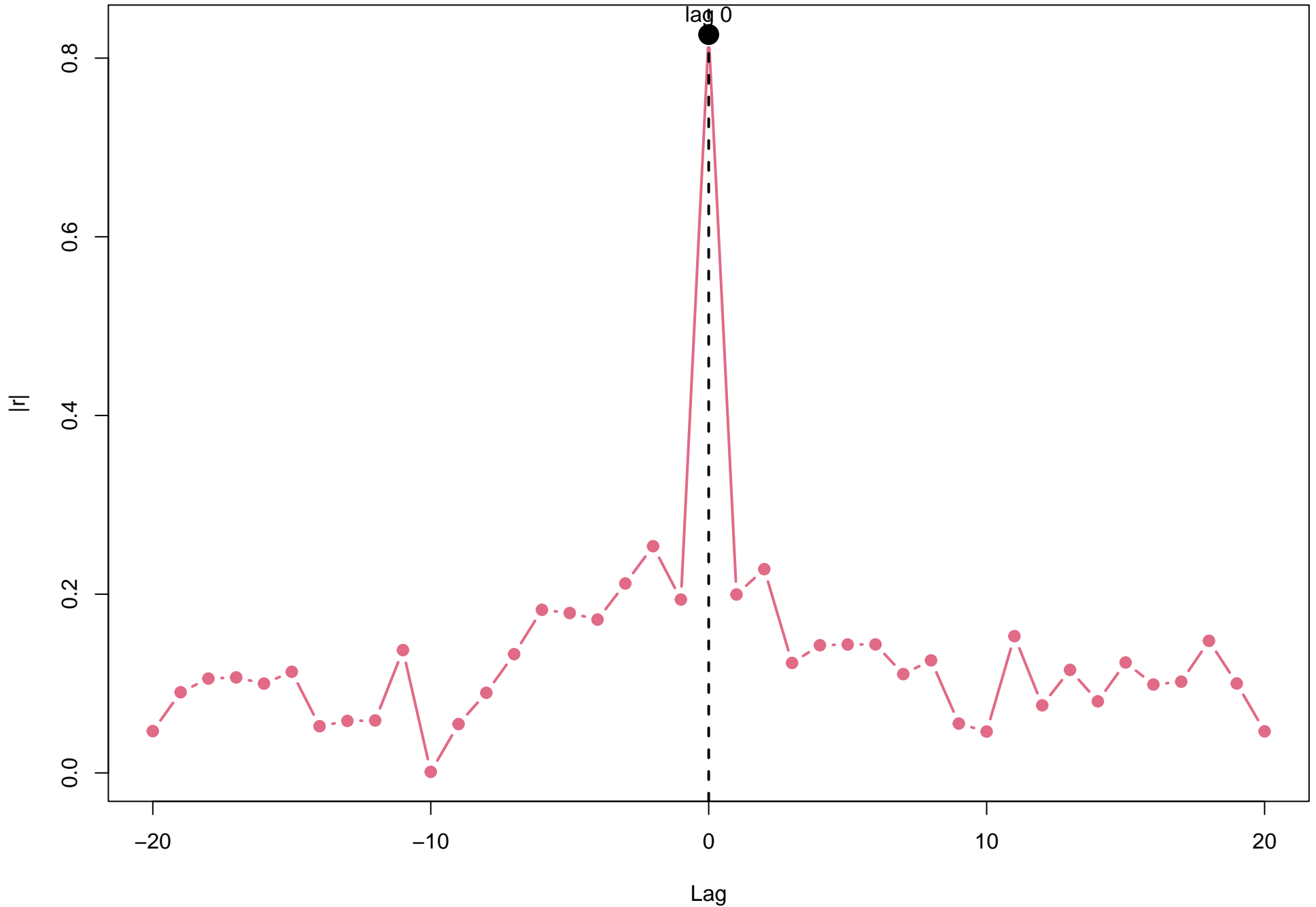
# Cross Correlation Function

Positive lags mean G1 is compared with later G3 values.



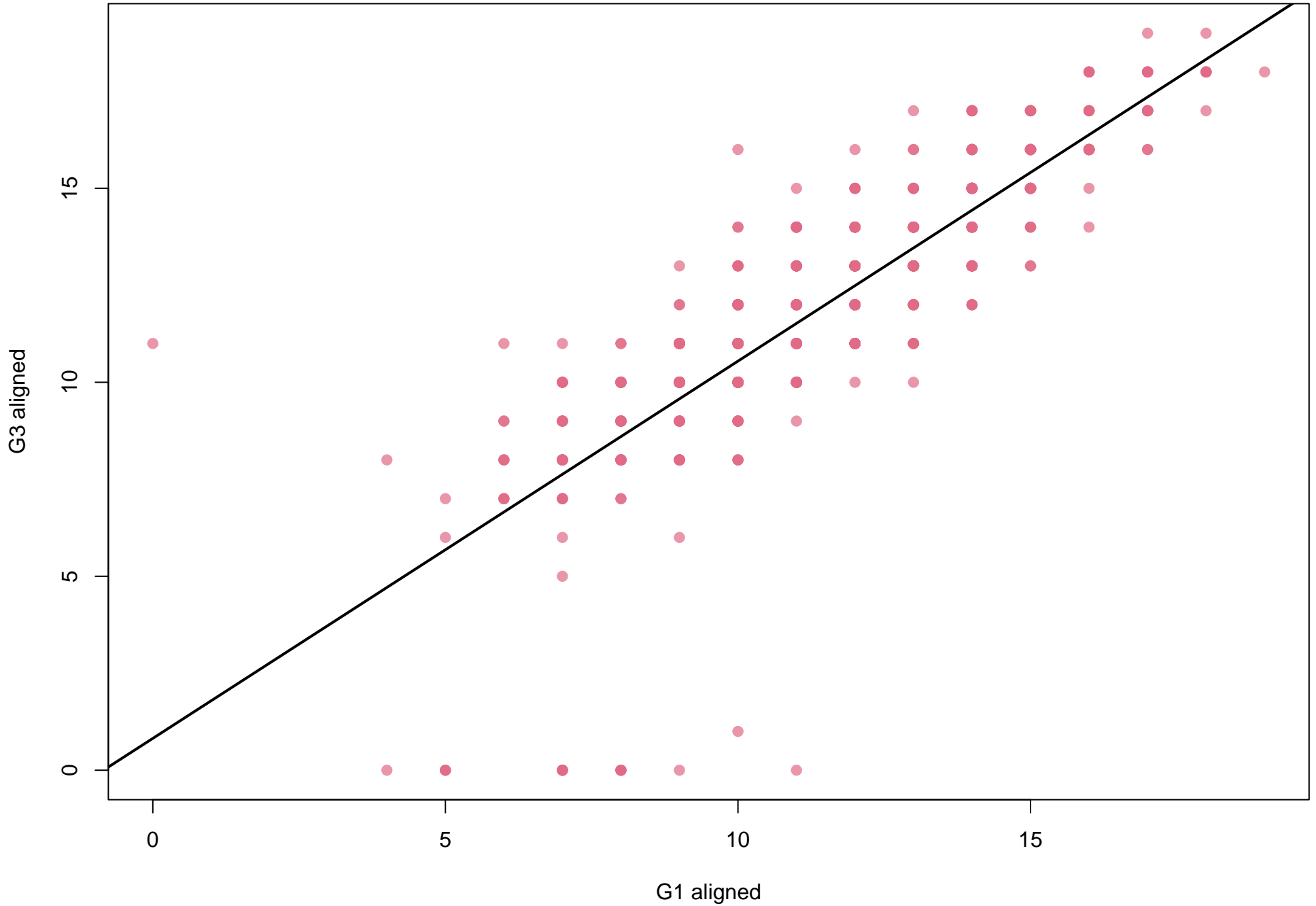
## Cross Correlation: Colorful Lag Direction Strength

The largest absolute value identifies the most pronounced lagged association.



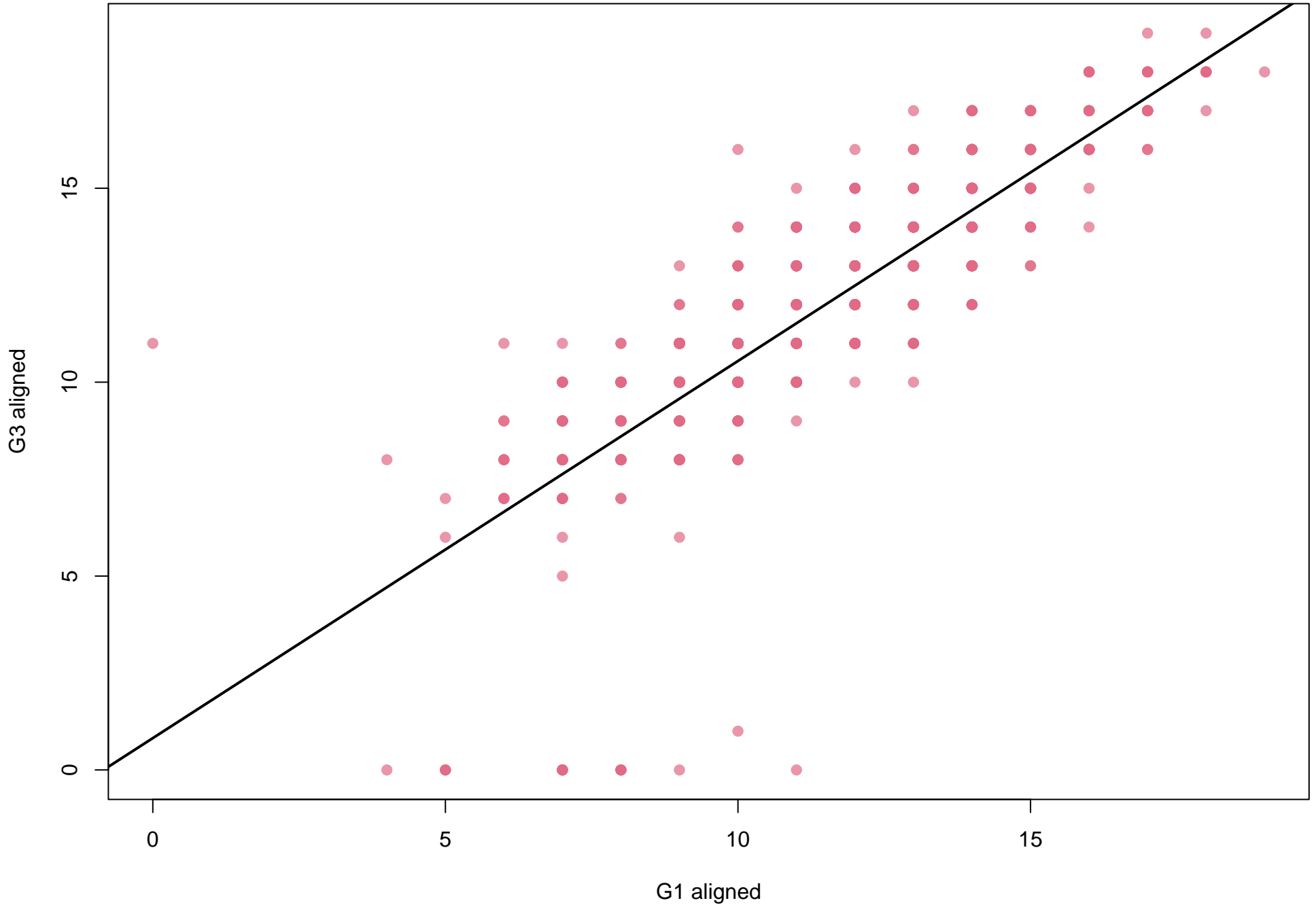
# Cross Correlation: Same-Row Scatter

Lag = 0; aligned-pair Pearson  $r = 0.8264$ .



# Cross Correlation: Strongest Lag Scatter

Lag = 0; aligned-pair Pearson  $r = 0.8264$ .



# Cross Correlation: Colorful Top Lag Rankings

This chart ranks the largest lagged associations by absolute strength.

