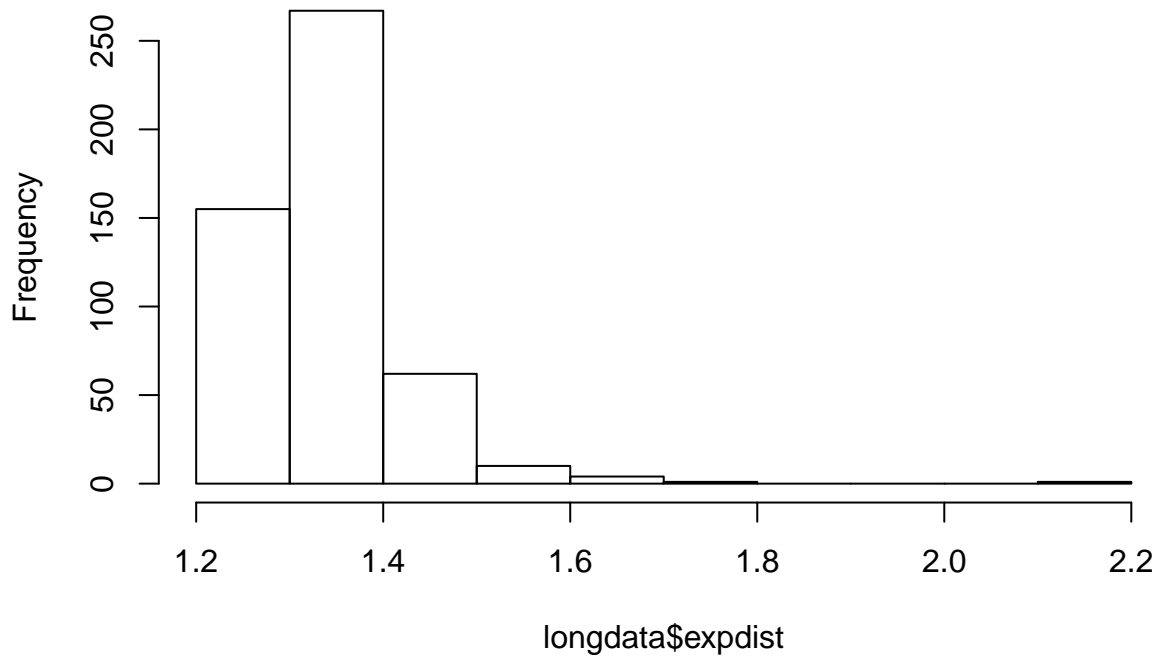


spacetimeadultanalysis

Below: A histogram of exponentiated word distances from “long”. These are the closest 500 words.

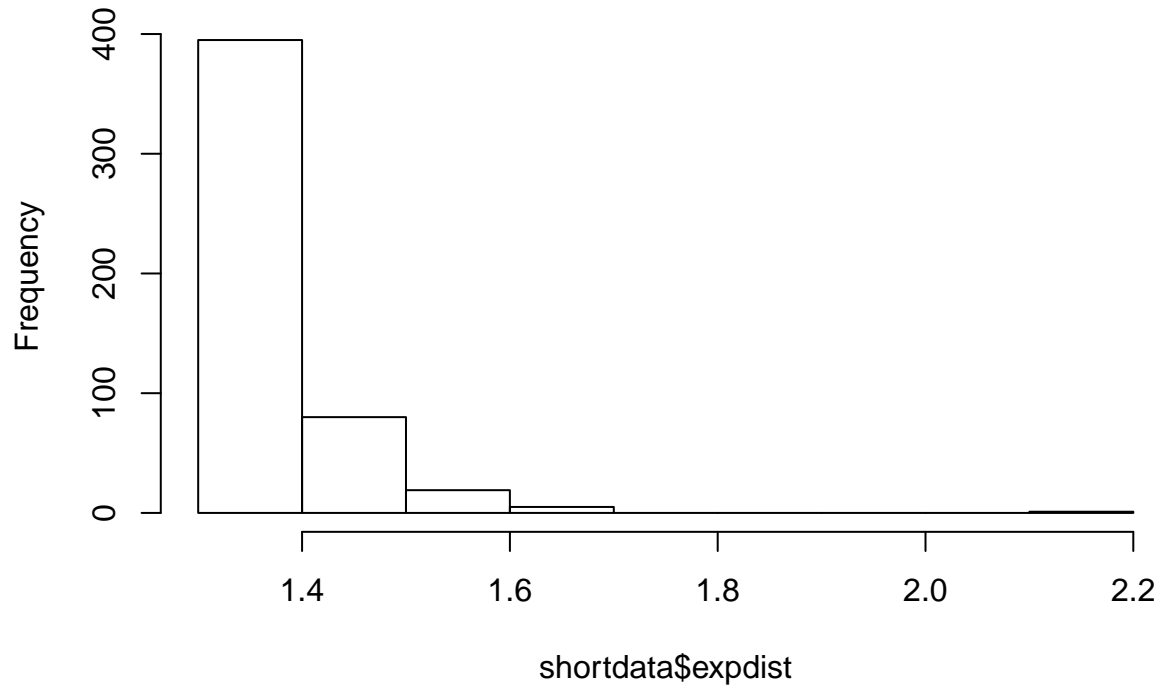
Exponentiating the distances spaces out further distances. This helps deal with the fact that in any space, there are more things further from you than closer to you: a unit increase in radius corresponds to a unit squared increase in area covered. The transformation helps normalize the distribution of words over distance. Throughout, we will be using exponentiated distances.

Histogram of `longdata$expdist`



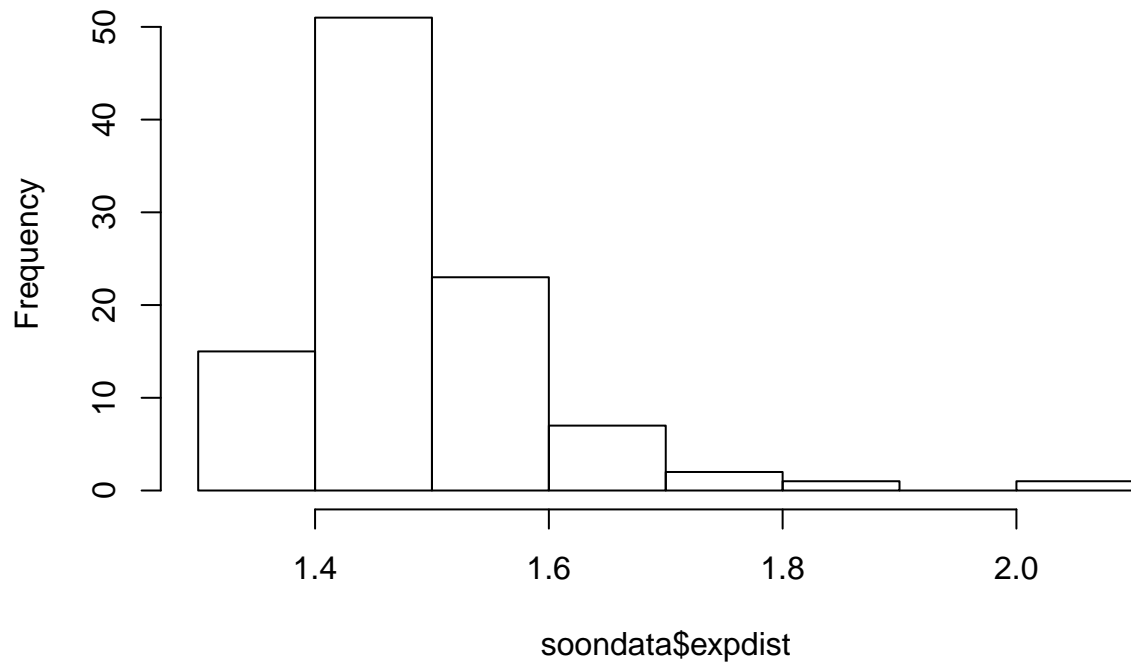
Below: A histogram of exponentiated word distances from “short”. These are the closest 500 words.

Histogram of shortdata\$expdist



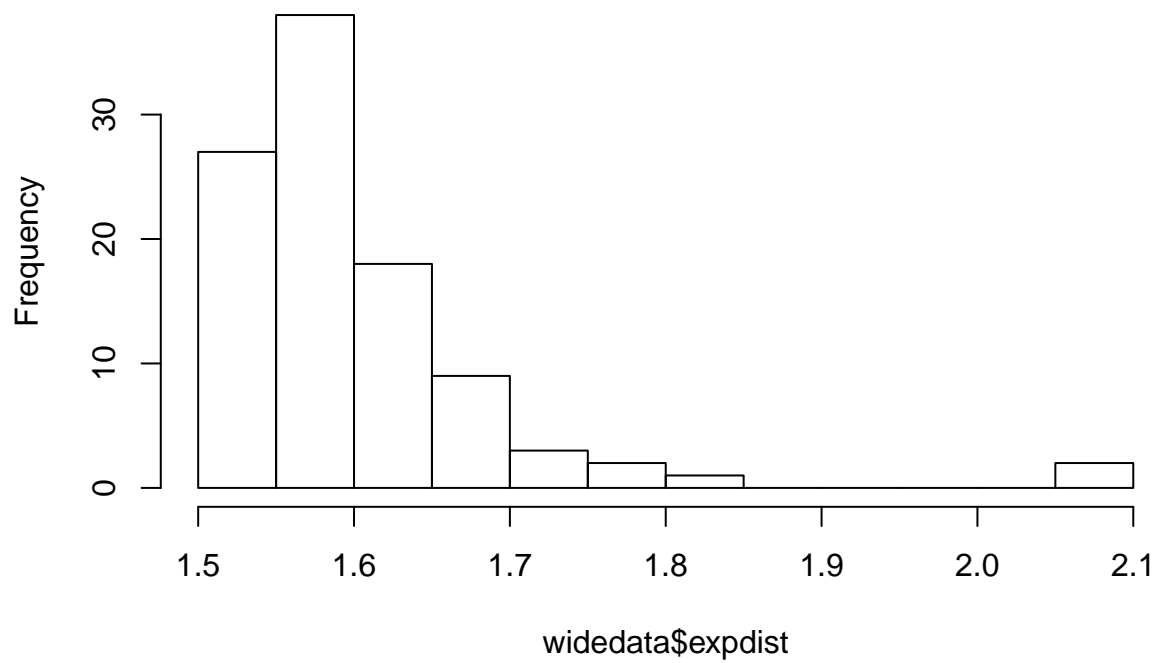
Below: A histogram of exponentiated word distances from “soon”. These are the closest 100 words.

Histogram of soondata\$expdist



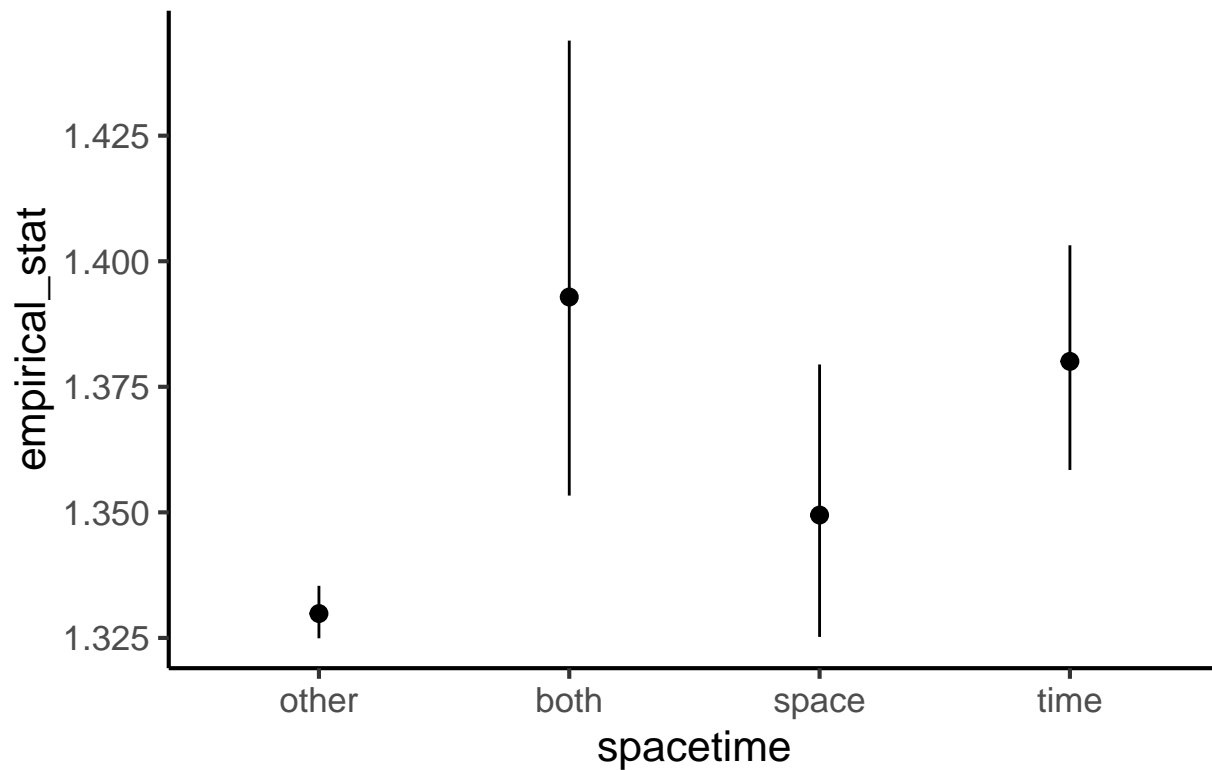
Below: A histogram of exponentiated word distances from “wide”. These are the closest 100 words.

Histogram of widedata\$expdist

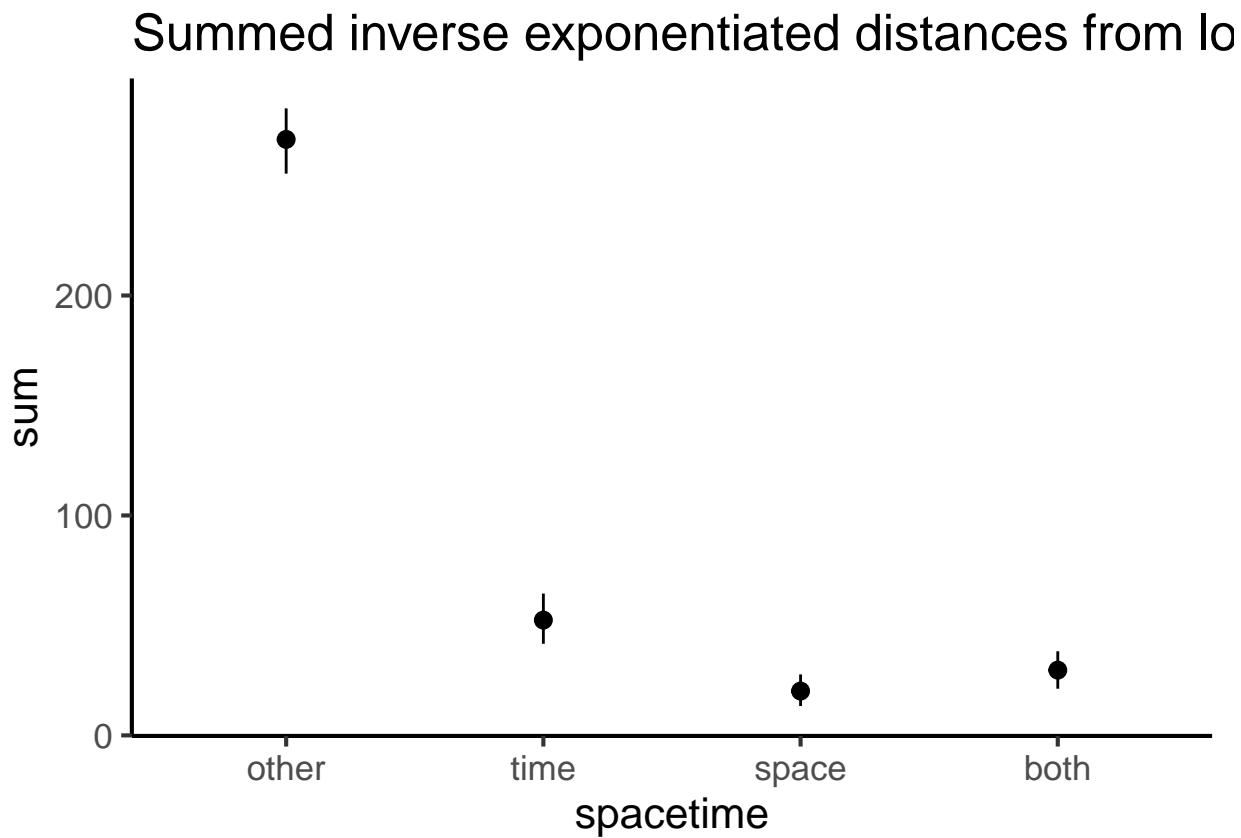


Below: Mean exponentiated distances of space, time, both and other words from “long”. Error bars here and throughout are 95% bootstrapped confidence intervals.

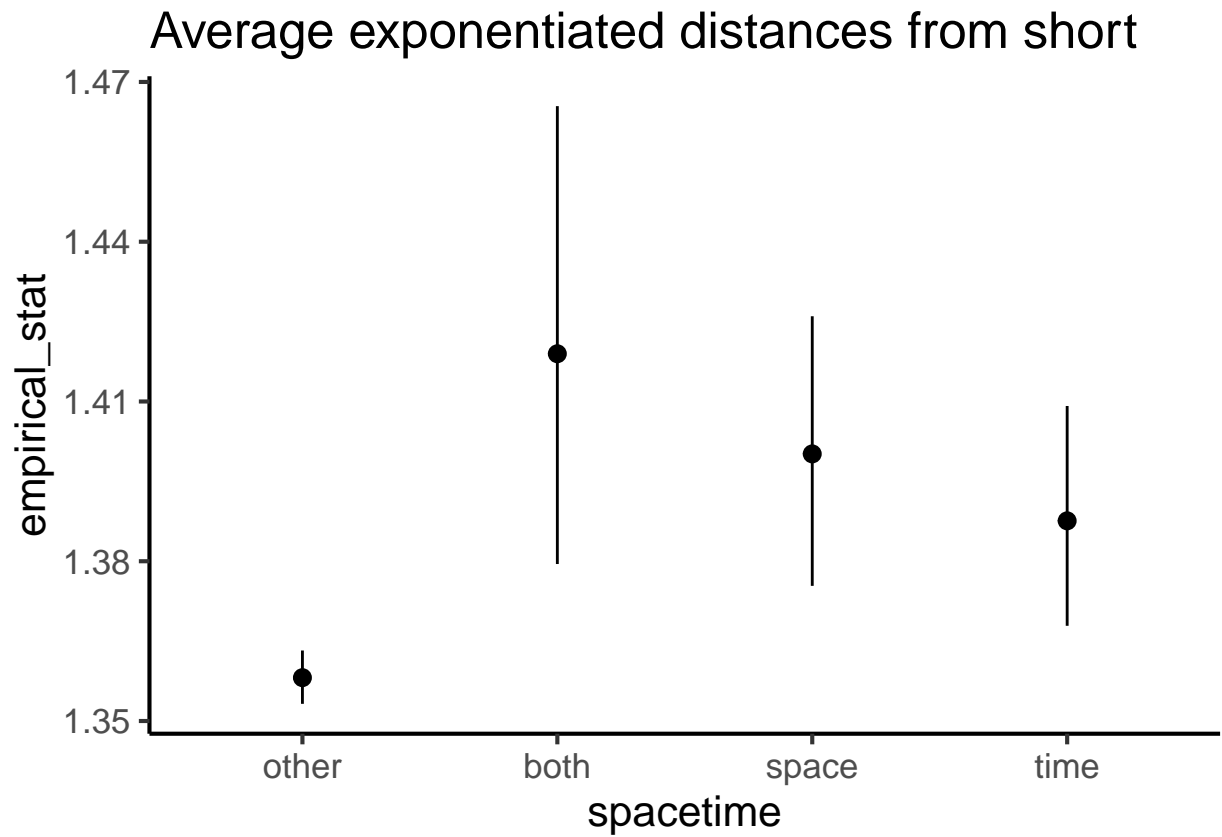
Average exponentiated distances from long



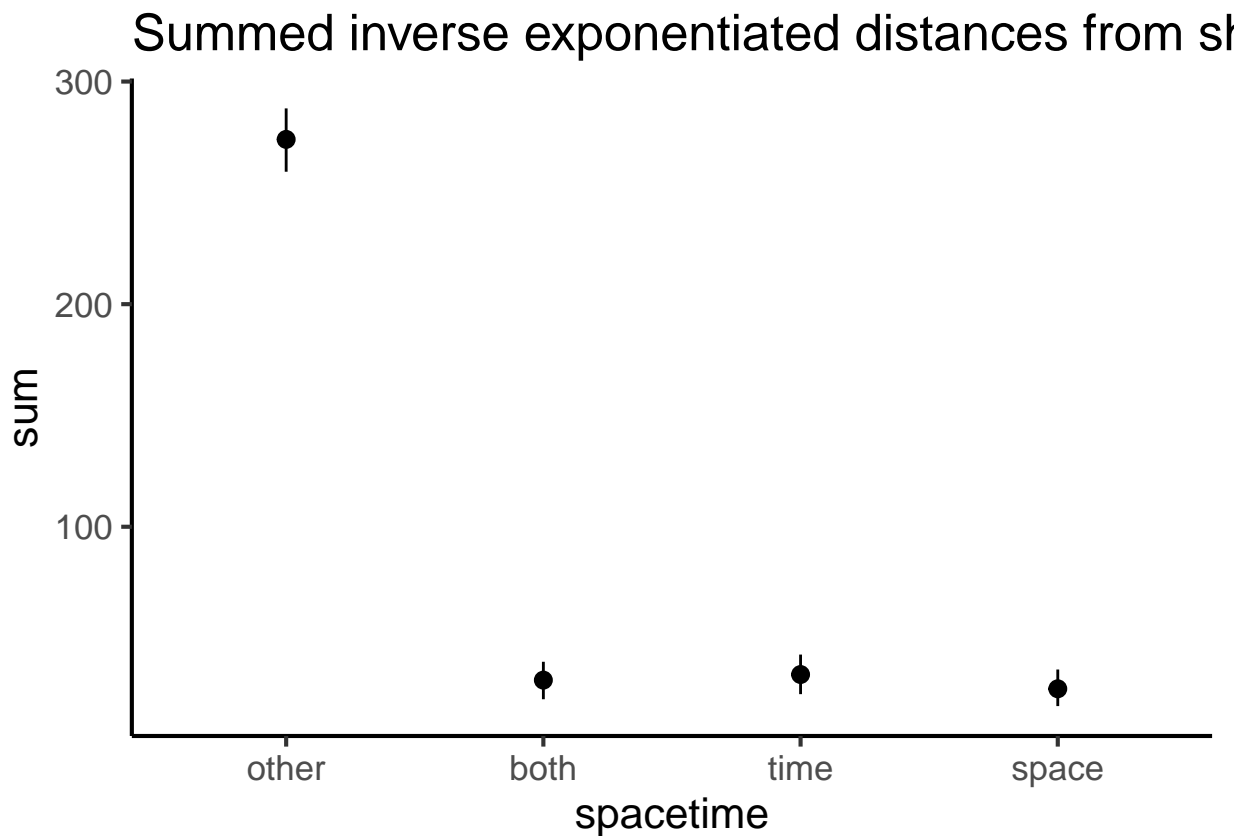
Below: Summed exponentiated distances of space, time, both and other words from “long”. Error bars here and throughout are 95% bootstrapped confidence intervals.



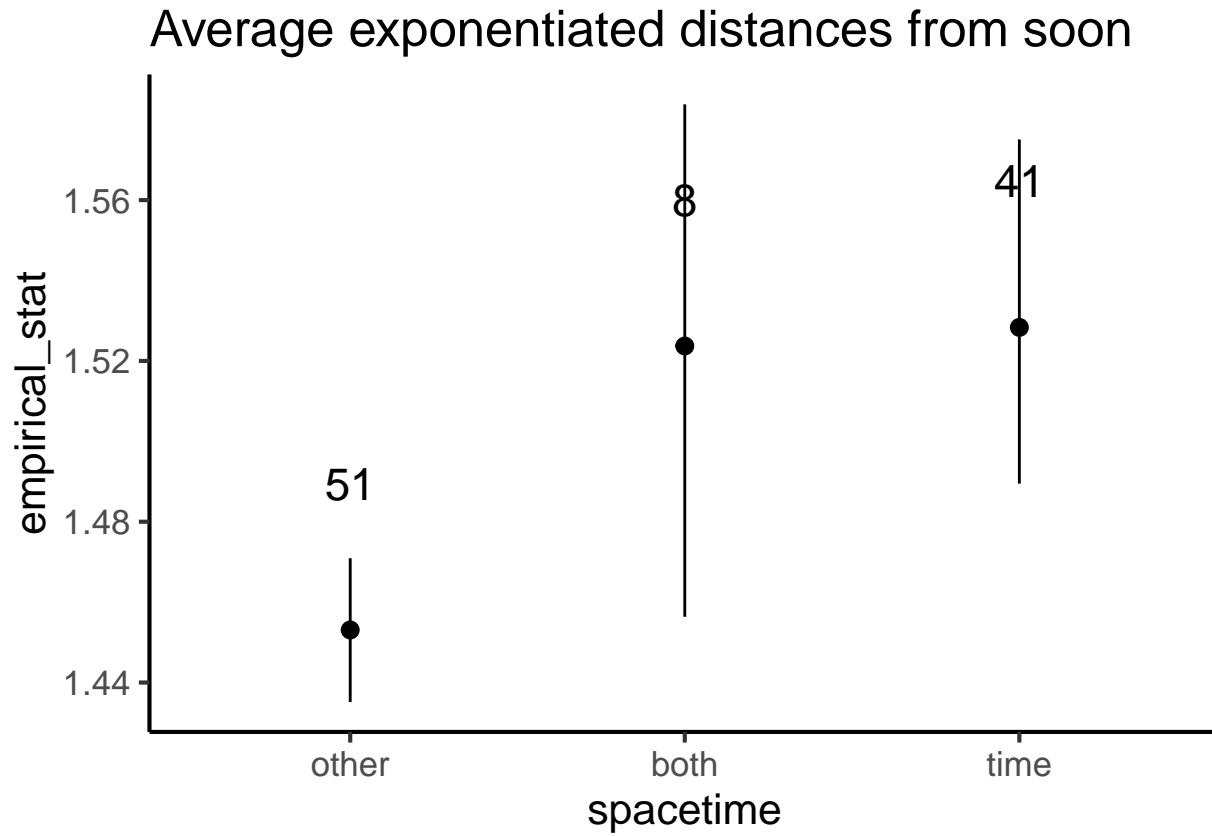
Below: Mean exponentiated distances of space, time, both and other words from “short”.



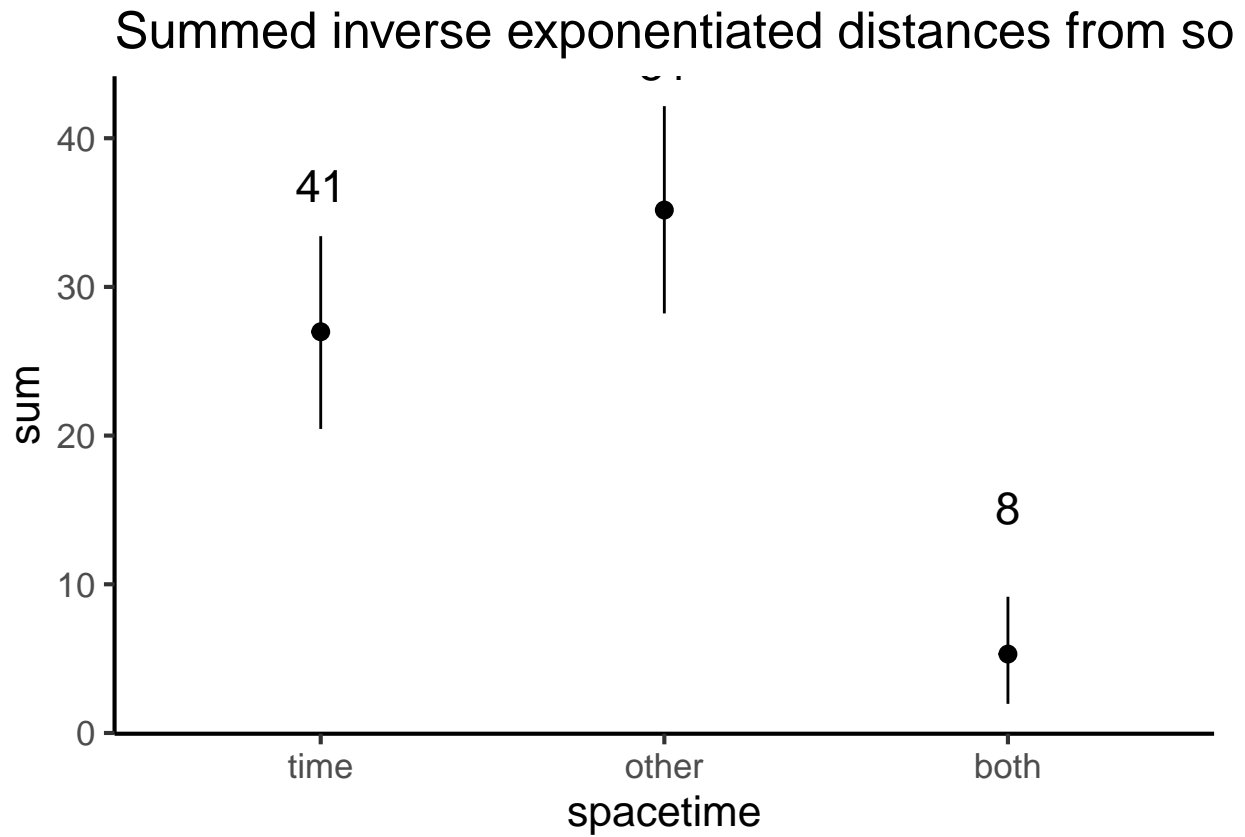
Below: Summed inverse exponentiated distances of space, time, both and other words from “short”.



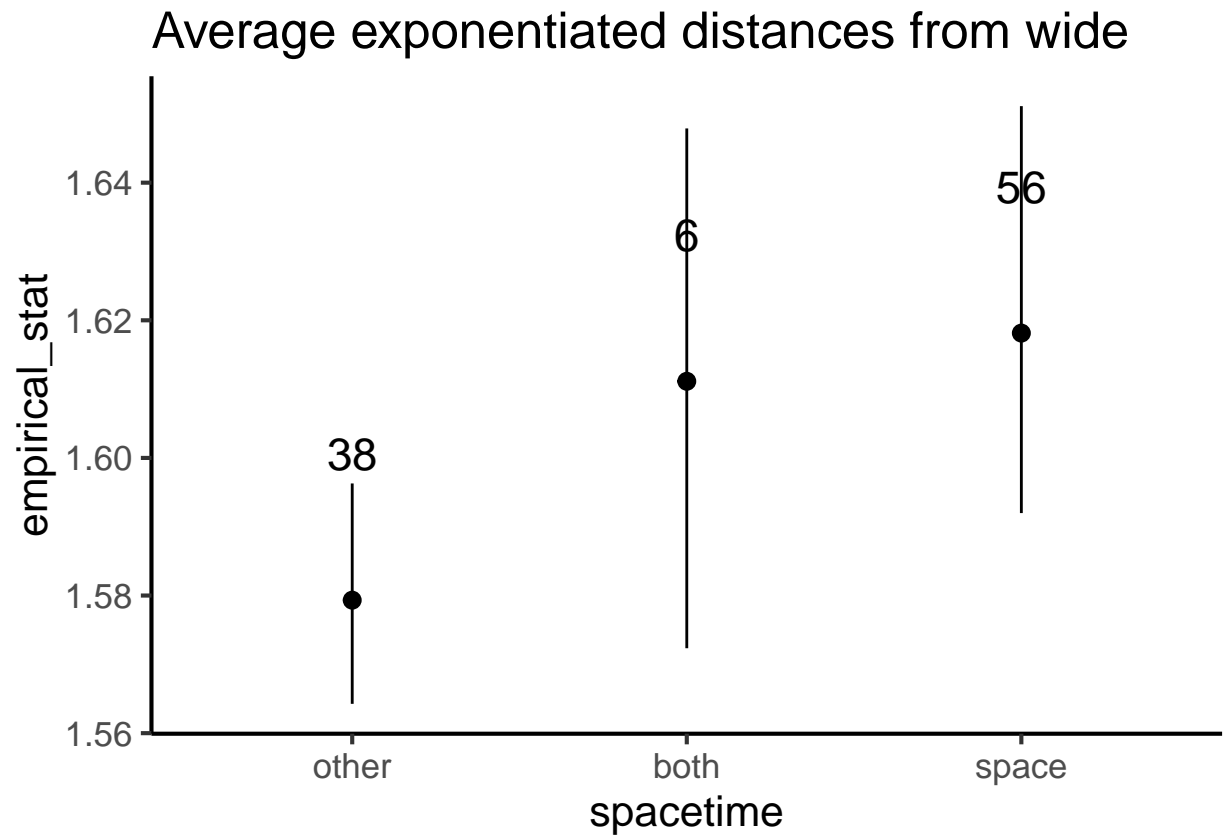
Below: Mean exponentiated distances of space, time, both and other words from “soon”. Note: there were no pure space words for ‘soon’.



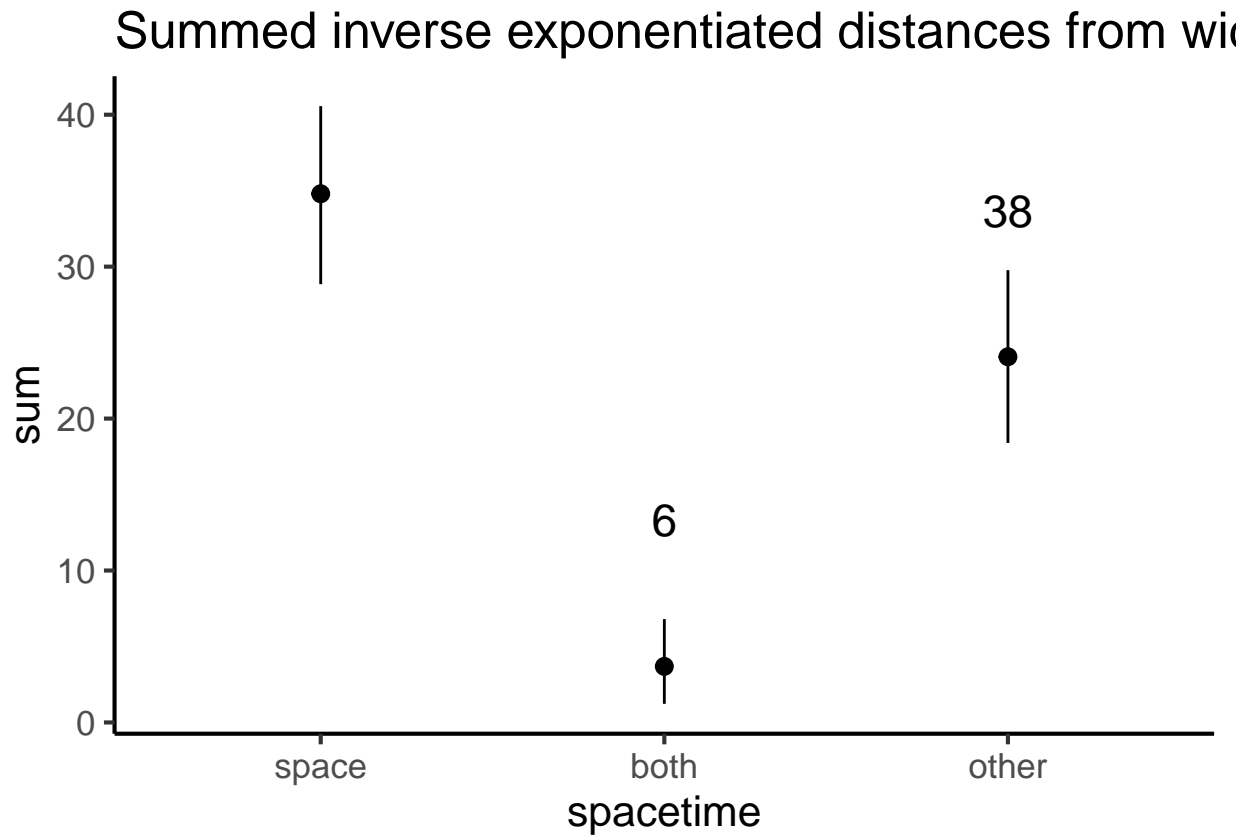
Below: Summed exponentiated distances of space, time, both and other words from “soon”. Note: there were no pure space words for ‘soon’.



Below: Mean exponentiated distances of space, time, both and other words from “wide”. Note: there were no pure time words for ‘wide’.



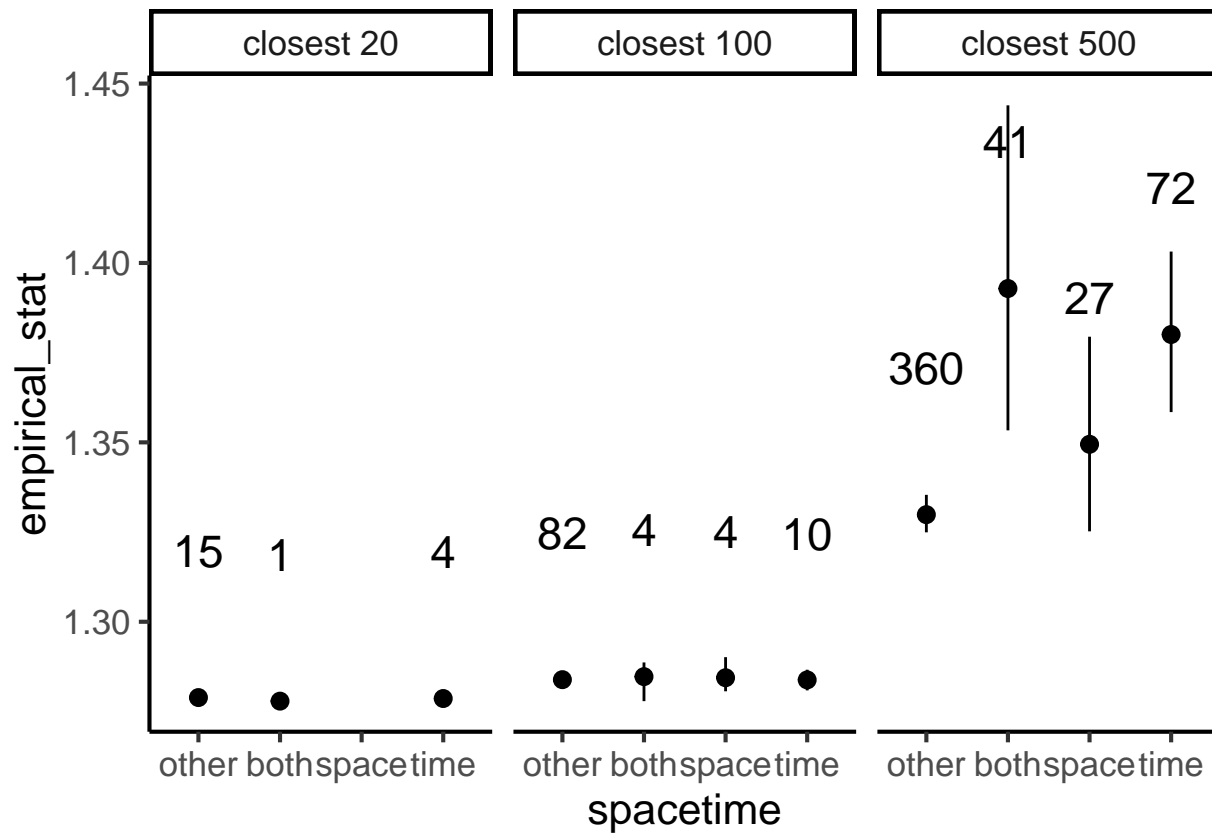
Below: Summed exponentiated distances of space, time, both and other words from “wide”. Note: there were no pure time words for ‘wide’.



Below: A plot of mean distances of space, time, both and other words from “long” within the closest 20, 100, and 500 neighbors. The numbers on the plot denote the number of words of that type in that range of neighbors.

```
## Warning: `cols` is now required.  
## Please use `cols = c(strap)`
```

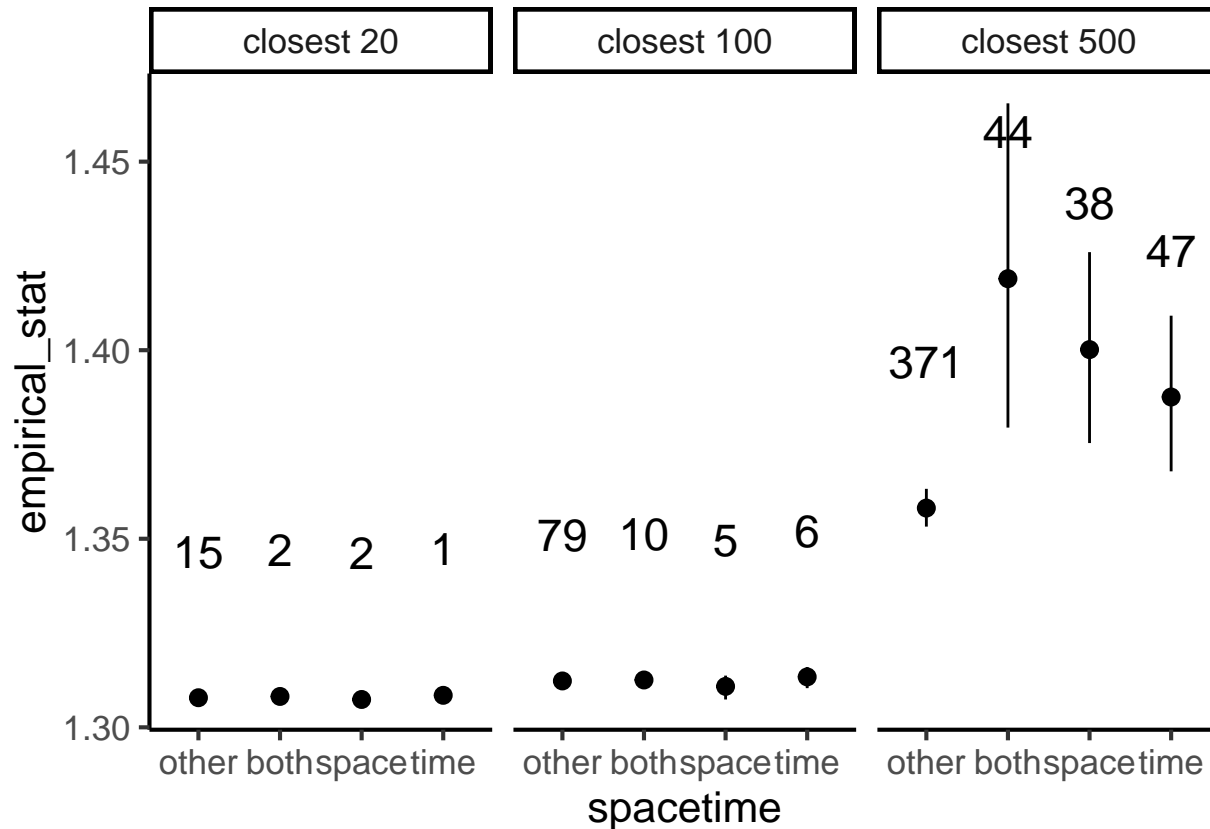
```
## Warning: `cols` is now required.  
## Please use `cols = c(strap)`
```



Below: A plot of mean distances of space, time, both and other words from “short” within the closest 20, 100, and 500 neighbors.

```
## Warning: `cols` is now required.
## Please use `cols = c(strap)`
```

```
## Warning: `cols` is now required.
## Please use `cols = c(strap)`
```



Below: Linear model predicting distance from “long” by word type (space, time, etc.) in the closest 100 words, where we’re more likely to see differences. Space is the reference category. Space and time are not significantly different.

```
##
## Call:
## glm(formula = expdist ~ spacetime, family = gaussian, data = longmodeldata)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -0.0068320 -0.0032613 -0.0003964  0.0036058  0.0066676
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   1.2843954   0.0019813  648.247  <2e-16 ***
## spacetimeother -0.0005361   0.0020291  -0.264    0.792
## spacetime     -0.0006019   0.0023443  -0.257    0.798
## spacetimeboth  0.0003083   0.0028020   0.110    0.913
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for gaussian family taken to be 1.570275e-05)
##
## Null deviance: 0.0015113  on 99  degrees of freedom
## Residual deviance: 0.0015075  on 96  degrees of freedom
## AIC: -816.46
##
## Number of Fisher Scoring iterations: 2
```

Below: Linear model predicting distance from “short” by word type (space, time, etc.) in the closest 100 words, where we’re more likely to see differences. Space is the reference category. Space and time are not significantly different.

```
##
## Call:
## glm(formula = expdist ~ spacetime, family = gaussian, data = shortmodeldata)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -0.0053595 -0.0029847 -0.0000214  0.0029386  0.0065084
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   1.310852   0.001506  870.217  <2e-16 ***
## spacetimeother 0.001443   0.001553   0.929    0.355
## spacetimeboth  0.001702   0.001845   0.922    0.359
## spacetime      0.002518   0.002040   1.235    0.220
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for gaussian family taken to be 1.134547e-05)
##
##      Null deviance: 0.0011071  on 99  degrees of freedom
## Residual deviance: 0.0010892  on 96  degrees of freedom
## AIC: -848.96
##
## Number of Fisher Scoring iterations: 2
```

Below: Linear model predicting distance from “soon” by word type (space, time, etc.) in the closest 100 words. Time is significantly different from ‘both’ and ‘other’; there’s only one space word, so the difference in distance probably can’t be reliably predicted.

```
##
## Call:
## glm(formula = expdist ~ spacetime, family = gaussian, data = soonmodeldata)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -0.14318 -0.06269 -0.02108  0.04000  0.56295
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   1.52833   0.01650  92.625  < 2e-16 ***
## spacetimeother -0.07526   0.02216  -3.396 0.000992 ***
## spacetimeboth  -0.00463   0.04084  -0.113 0.909970
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for gaussian family taken to be 0.01116259)
##
##      Null deviance: 1.2217  on 99  degrees of freedom
## Residual deviance: 1.0828  on 97  degrees of freedom
## AIC: -160.78
##
```

```
## Number of Fisher Scoring iterations: 2
```

Below: Linear model predicting distance from “wide” by word type (space, time, etc.) in the closest 100 words. Space is significantly different from ‘other’, marginally from ‘both’; there are no time words to predict from.

```
##
```

```
## Call:
```

```
## glm(formula = expdist ~ spacetime, family = gaussian, data = widemodeldata)
```

```
##
```

```
## Deviance Residuals:
```

```
##      Min       1Q   Median       3Q      Max
## -0.08543 -0.04531 -0.02278  0.02051  0.44547
```

```
##
```

```
## Coefficients:
```

```
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1.618143   0.011781 137.348  <2e-16 ***
## spacetimeboth -0.007005   0.037872  -0.185   0.8536
## spacetimeother -0.038814   0.018530  -2.095   0.0388 *
```

```
## ---
```

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

```
##
```

```
## (Dispersion parameter for gaussian family taken to be 0.007772847)
```

```
##
```

```
##      Null deviance: 0.78850  on 99  degrees of freedom
```

```
## Residual deviance: 0.75397  on 97  degrees of freedom
```

```
## AIC: -196.97
```

```
##
```

```
## Number of Fisher Scoring iterations: 2
```