Sensitivity Analysis

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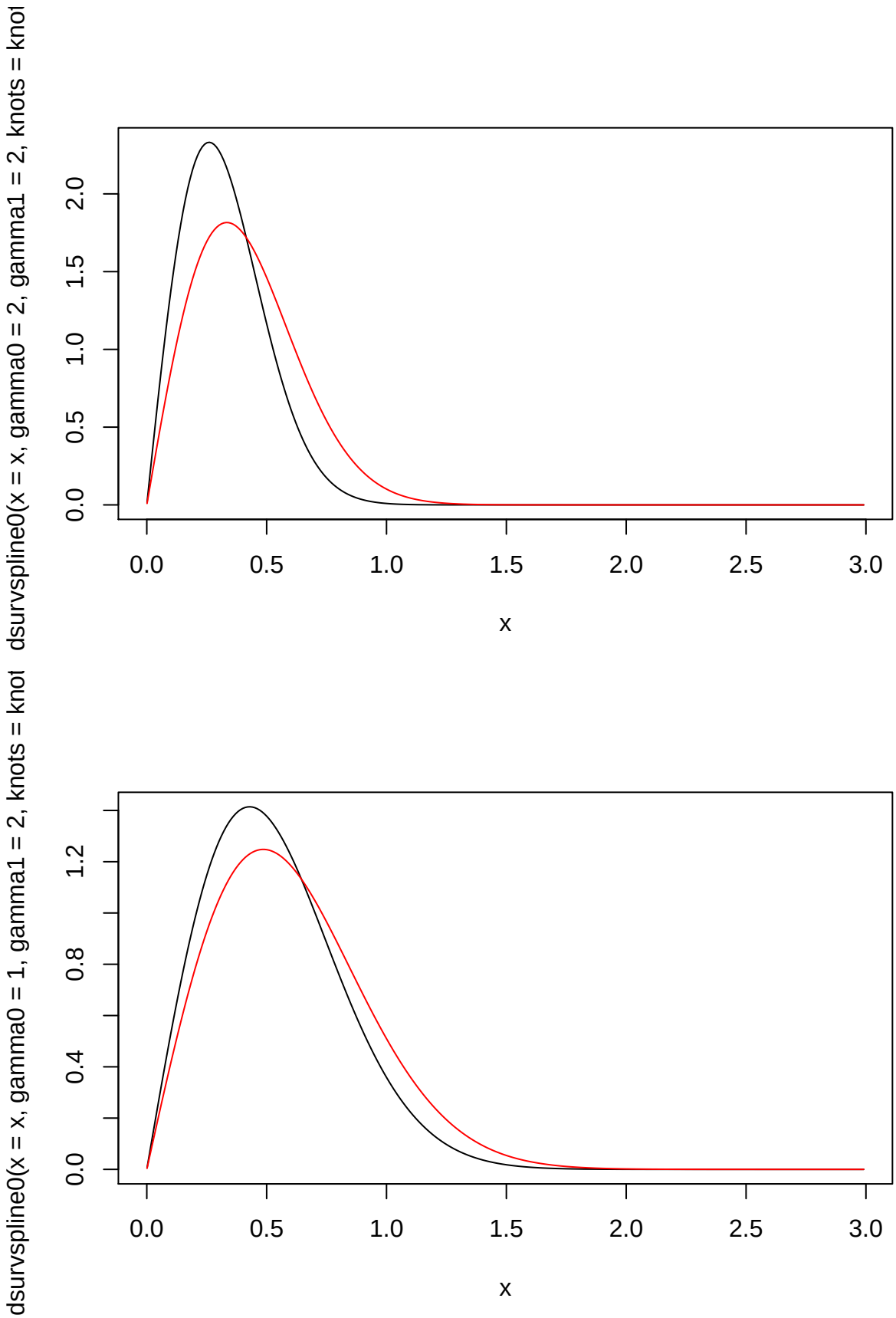
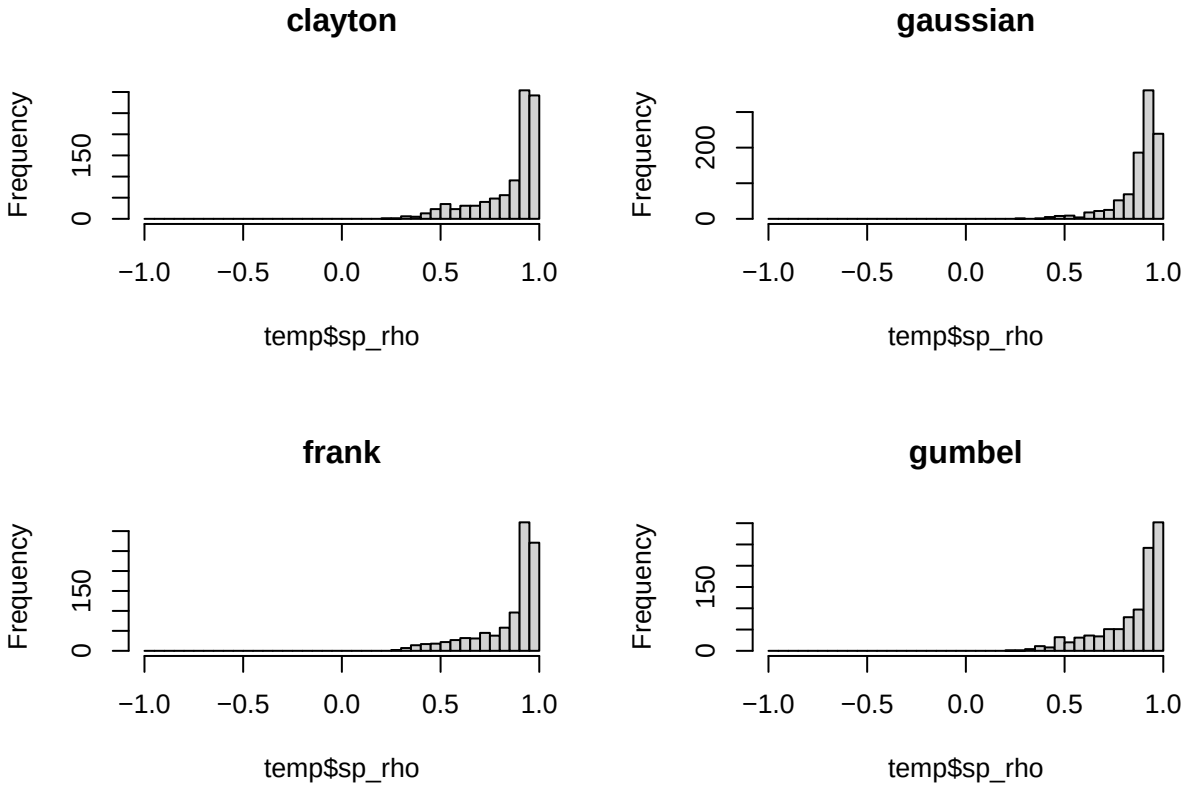
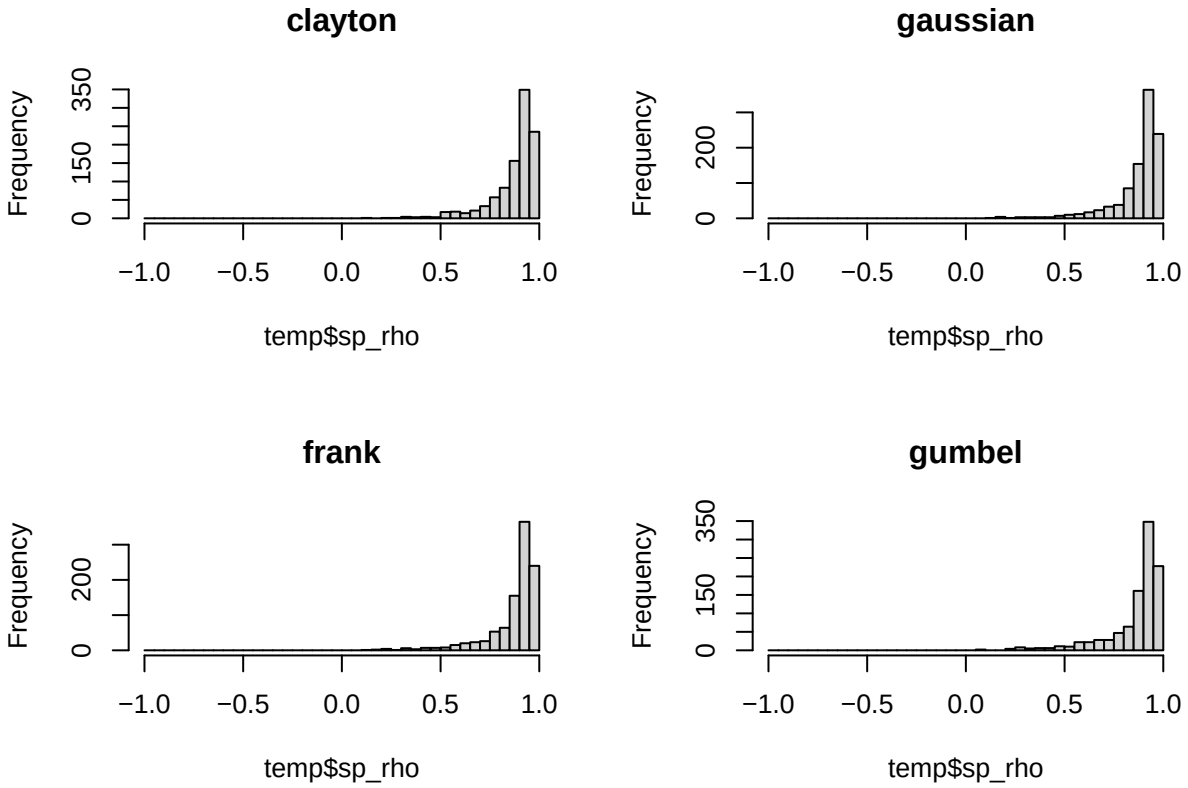
Without time ordering



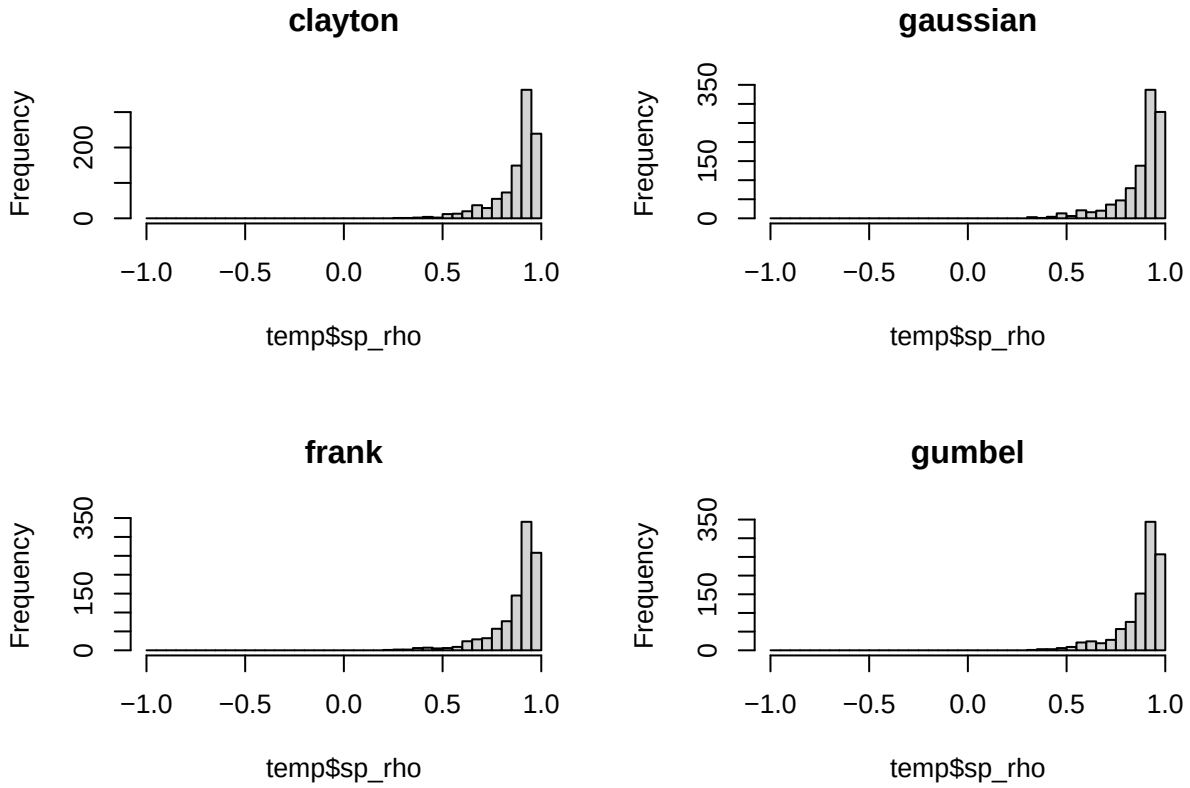
Strong




```
## # A tibble: 4 x 8
##   unid       min   max  mean median    p1   p99    sd
##   <chr>    <dbl> <dbl> <dbl>  <dbl> <dbl> <dbl> <dbl>
## 1 clayton  0.249 0.997 0.851  0.922 0.367 0.992 0.155
## 2 frank    0.279 0.994 0.849  0.925 0.360 0.990 0.159
## 3 gaussian 0.282 0.990 0.885  0.919 0.475 0.985 0.102
## 4 gumbel   0.244 0.995 0.843  0.913 0.379 0.993 0.158
```

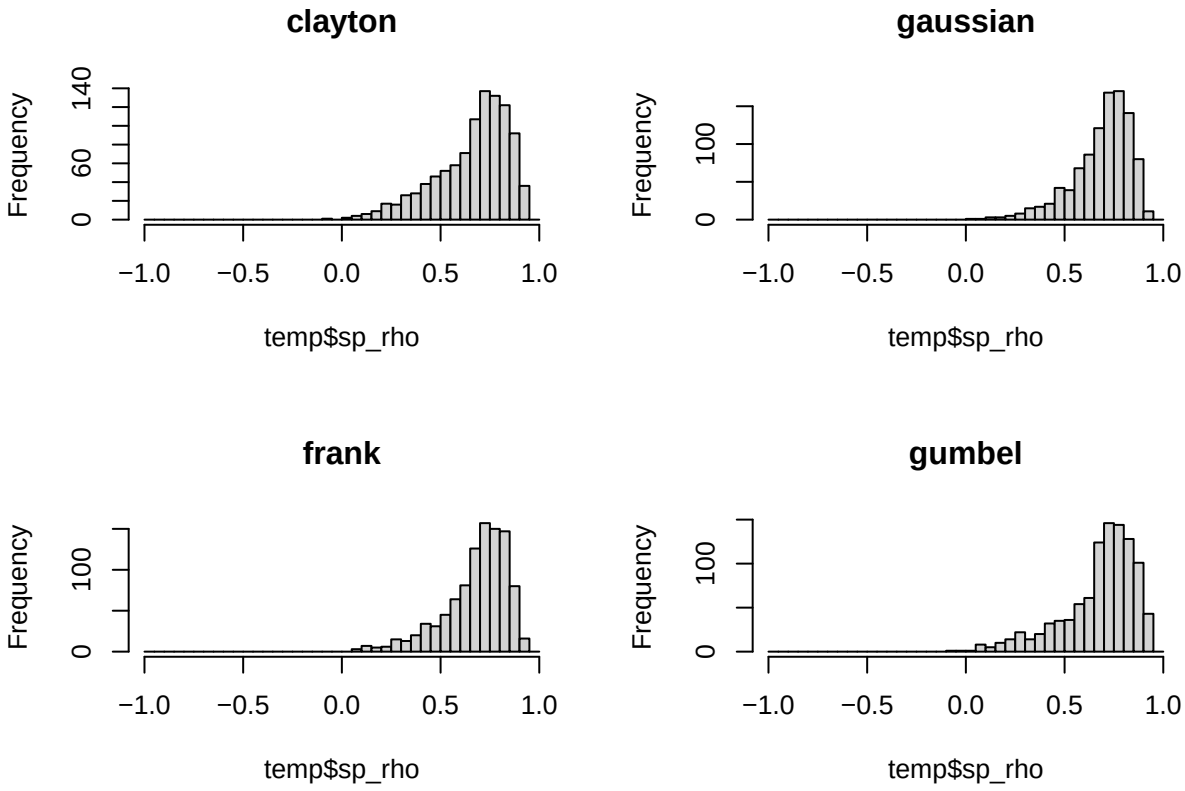



```
## # A tibble: 4 x 8
##   unid        min   max  mean median    p1   p99    sd
##   <chr>     <dbl> <dbl> <dbl>  <dbl> <dbl> <dbl> <dbl>
## 1 clayton  0.138  0.992 0.874  0.920 0.406 0.985 0.120
## 2 frank    0.114  0.994 0.872  0.919 0.323 0.984 0.132
## 3 gaussian 0.105  0.991 0.875  0.915 0.331 0.987 0.127
## 4 gumbel   0.0622 0.992 0.860  0.916 0.287 0.985 0.147
```

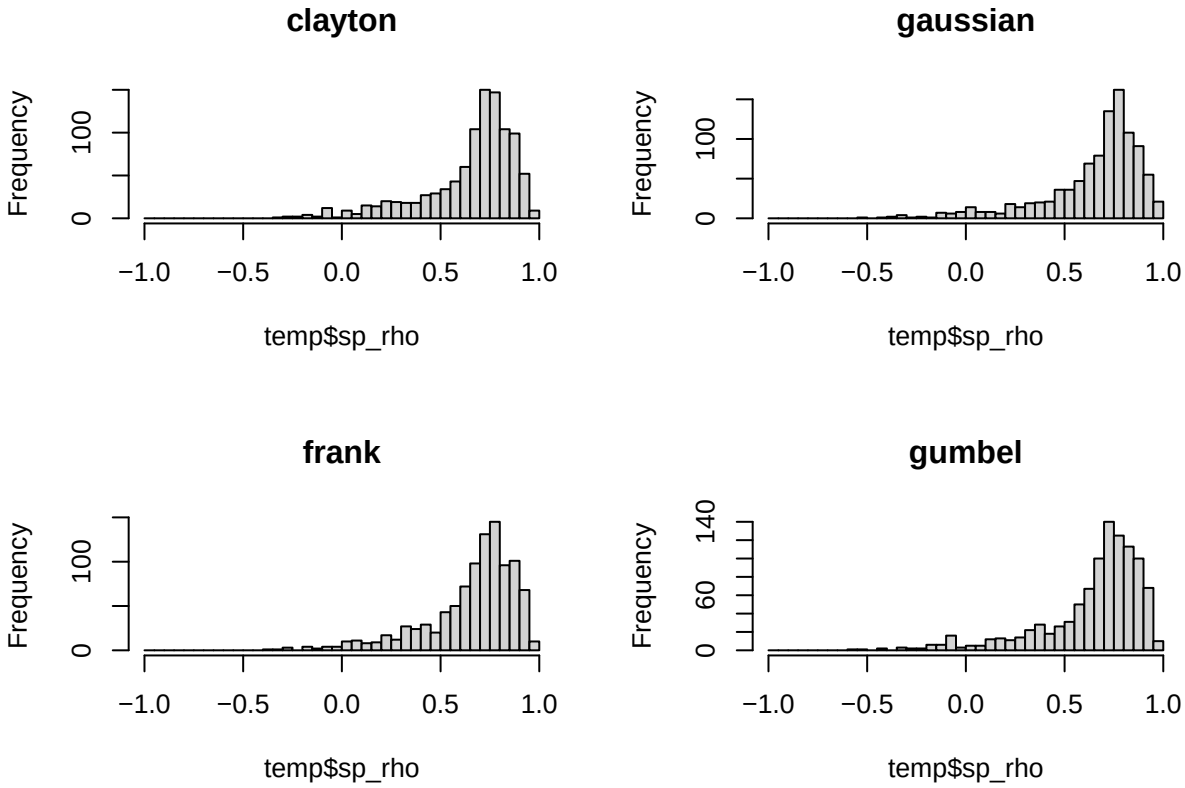



```
## # A tibble: 4 x 8
##   unid       min   max  mean median    p1   p99    sd
##   <chr>    <dbl> <dbl> <dbl>  <dbl> <dbl> <dbl> <dbl>
## 1 clayton  0.264 0.990 0.878  0.919 0.504 0.984 0.110
## 2 frank    0.209 0.990 0.875  0.919 0.386 0.984 0.119
## 3 gaussian 0.311 0.995 0.880  0.921 0.473 0.986 0.115
## 4 gumbel   0.315 0.992 0.879  0.918 0.484 0.985 0.111
```

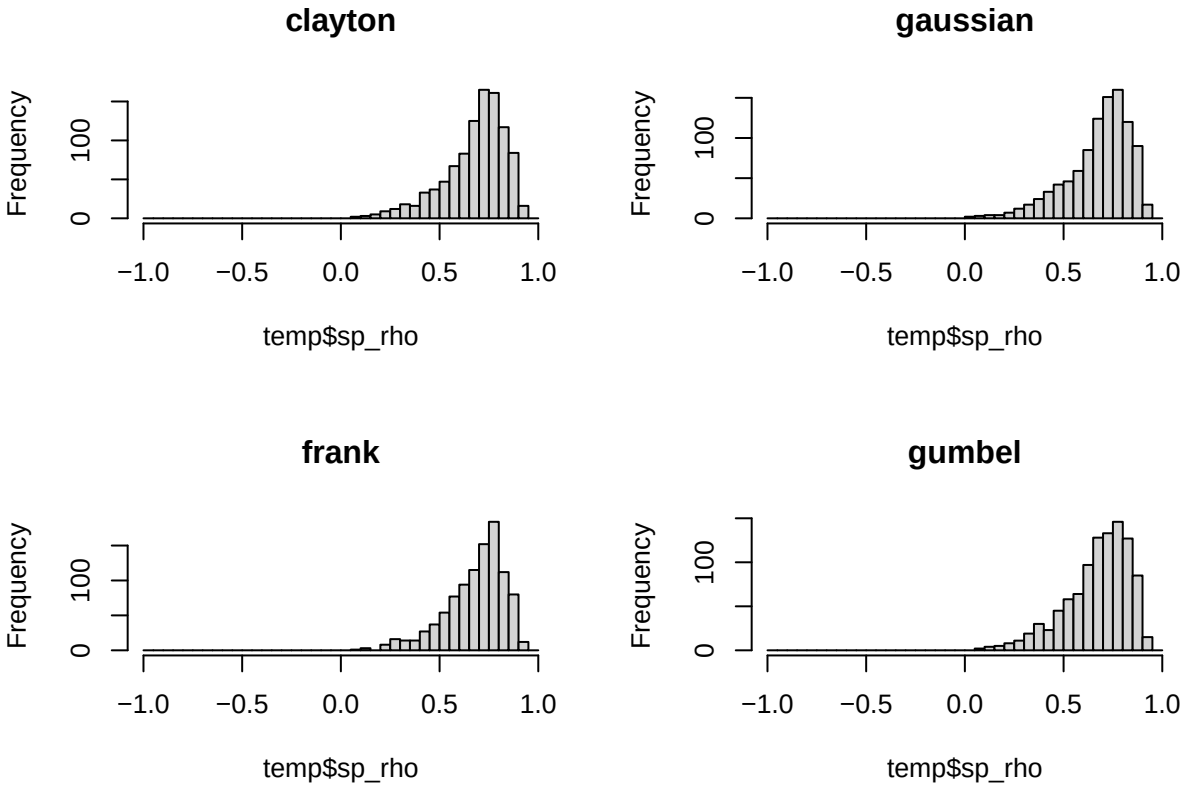
Moderate




```
## # A tibble: 4 x 8
##   unid         min   max  mean median     p1   p99    sd
##   <chr>      <dbl> <dbl> <dbl>  <dbl>  <dbl> <dbl> <dbl>
## 1 clayton  -0.0783 0.936 0.661  0.710 0.128  0.921 0.187
## 2 frank     0.0554 0.924 0.681  0.719 0.157  0.907 0.162
## 3 gaussian  0.0139 0.938 0.689  0.721 0.235  0.900 0.147
## 4 gumbel   -0.0571 0.940 0.677  0.717 0.0963 0.926 0.185
```

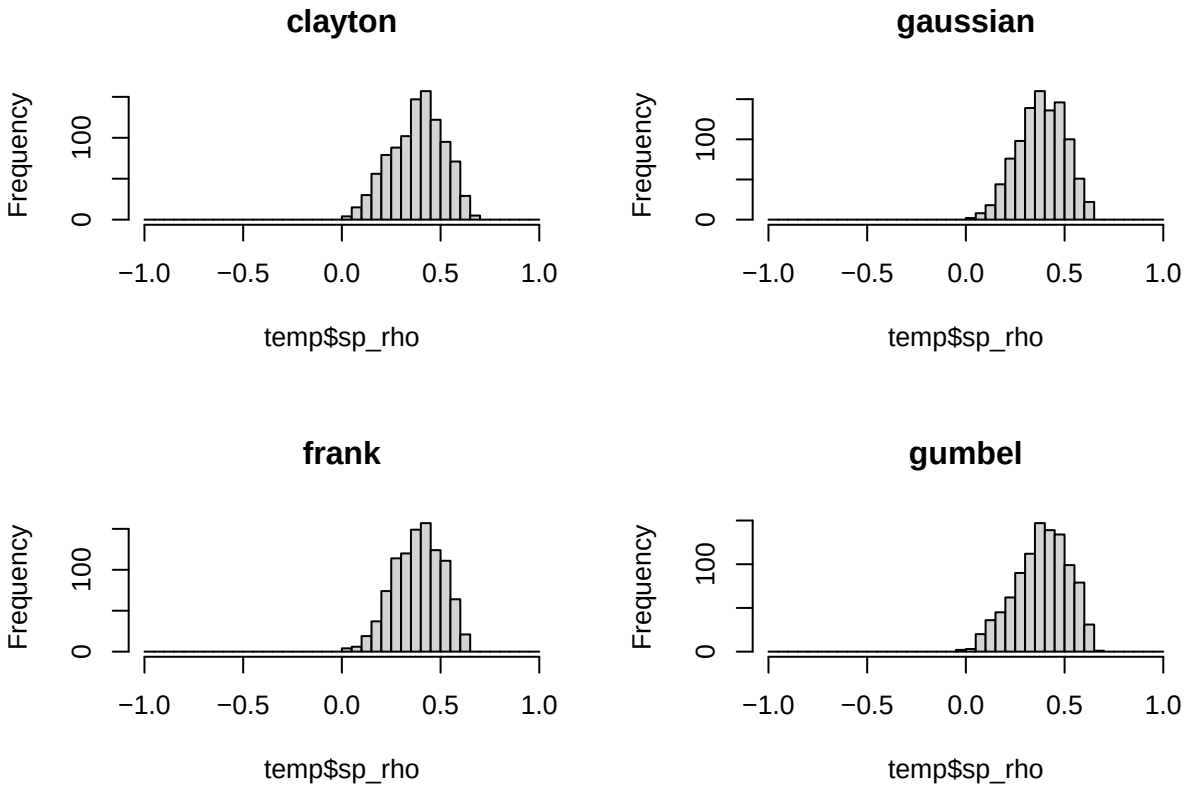



```
## # A tibble: 4 x 8
##   unid        min   max  mean median     p1   p99    sd
##   <chr>     <dbl> <dbl> <dbl>  <dbl>  <dbl> <dbl> <dbl>
## 1 clayton  -0.314 0.970 0.651  0.720 -0.114 0.945 0.237
## 2 frank    -0.363 0.960 0.657  0.722 -0.137 0.950 0.232
## 3 gaussian -0.537 0.980 0.651  0.729 -0.224 0.961 0.251
## 4 gumbel   -0.557 0.969 0.648  0.723 -0.205 0.949 0.258
```

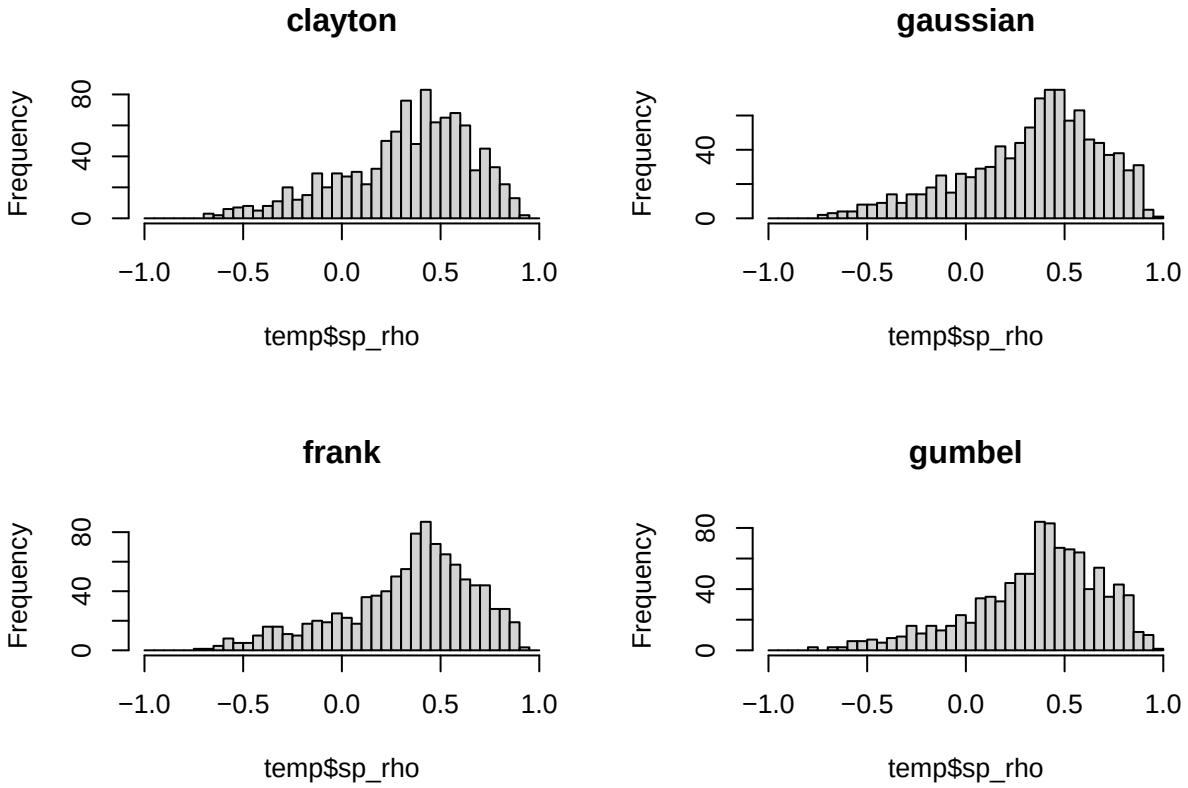



```
## # A tibble: 4 x 8
##   unid         min   max  mean median    p1   p99    sd
##   <chr>      <dbl> <dbl> <dbl>  <dbl> <dbl> <dbl> <dbl>
## 1 clayton  0.0539  0.933 0.678  0.714 0.200 0.905 0.158
## 2 frank    0.0923  0.920 0.681  0.715 0.226 0.902 0.149
## 3 gaussian 0.00596 0.935 0.676  0.712 0.173 0.909 0.163
## 4 gumbel   0.0772  0.928 0.672  0.702 0.194 0.907 0.160
```

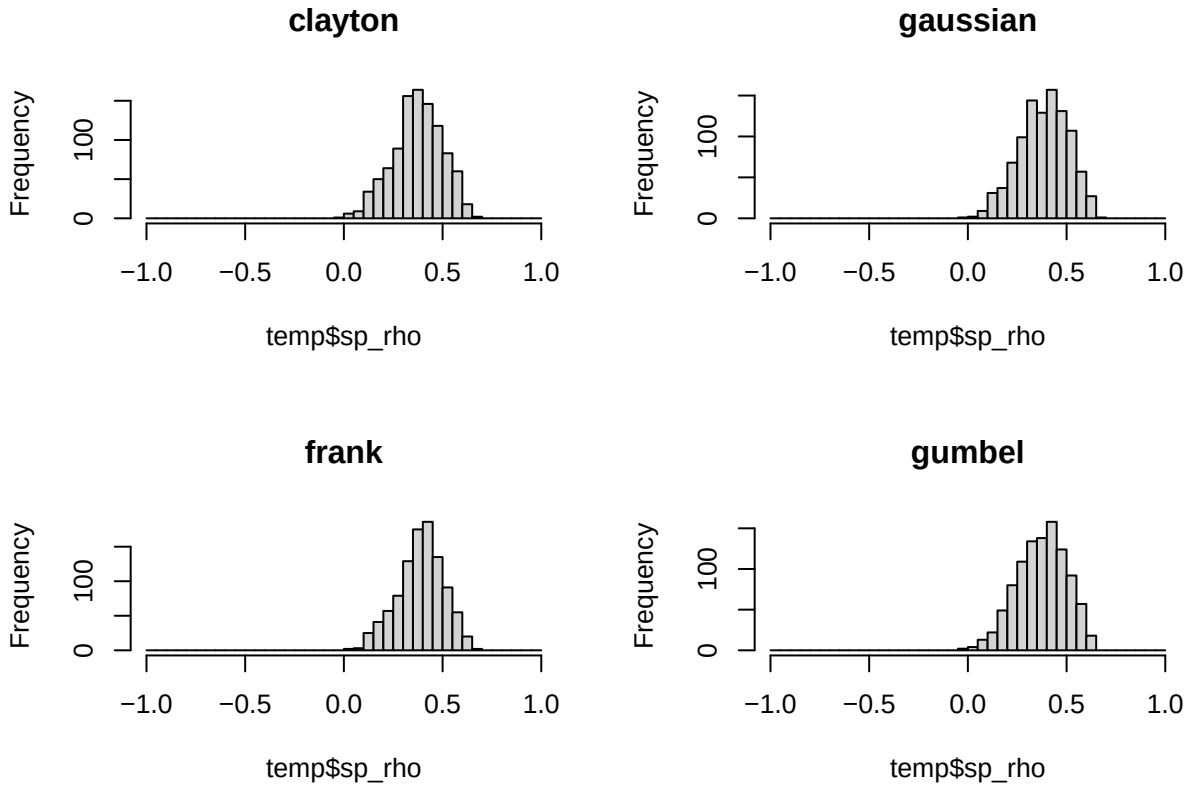
Weak




```
## # A tibble: 4 x 8
##   unid         min   max  mean median     p1   p99    sd
##   <chr>      <dbl> <dbl> <dbl>  <dbl>  <dbl> <dbl> <dbl>
## 1 clayton   0.0339 0.668 0.381  0.392 0.0829 0.632 0.132
## 2 frank     0.0180 0.646 0.387  0.393 0.104  0.613 0.121
## 3 gaussian  0.0164 0.648 0.382  0.382 0.105  0.609 0.119
## 4 gumbel   -0.0297 0.650 0.384  0.395 0.0686 0.630 0.135
```




```
## # A tibble: 4 x 8
##   unid        min   max  mean median     p1   p99    sd
##   <chr>     <dbl> <dbl> <dbl>  <dbl>  <dbl> <dbl> <dbl>
## 1 clayton  -0.672 0.936 0.327  0.382 -0.554 0.859 0.328
## 2 frank    -0.701 0.908 0.335  0.396 -0.556 0.872 0.333
## 3 gaussian -0.728 0.953 0.338  0.400 -0.577 0.889 0.346
## 4 gumbel   -0.767 0.953 0.358  0.410 -0.554 0.907 0.326
```




```
## # A tibble: 4 x 8
##   unid         min   max  mean median     p1   p99    sd
##   <chr>      <dbl> <dbl> <dbl>  <dbl>  <dbl> <dbl> <dbl>
## 1 clayton  -0.0383 0.656 0.374  0.382 0.0609 0.618 0.125
## 2 frank     0.0242 0.654 0.389  0.396 0.109  0.610 0.115
## 3 gaussian -0.0110 0.654 0.384  0.391 0.0925 0.624 0.124
## 4 gumbel   -0.0408 0.646 0.375  0.381 0.0841 0.622 0.124
```

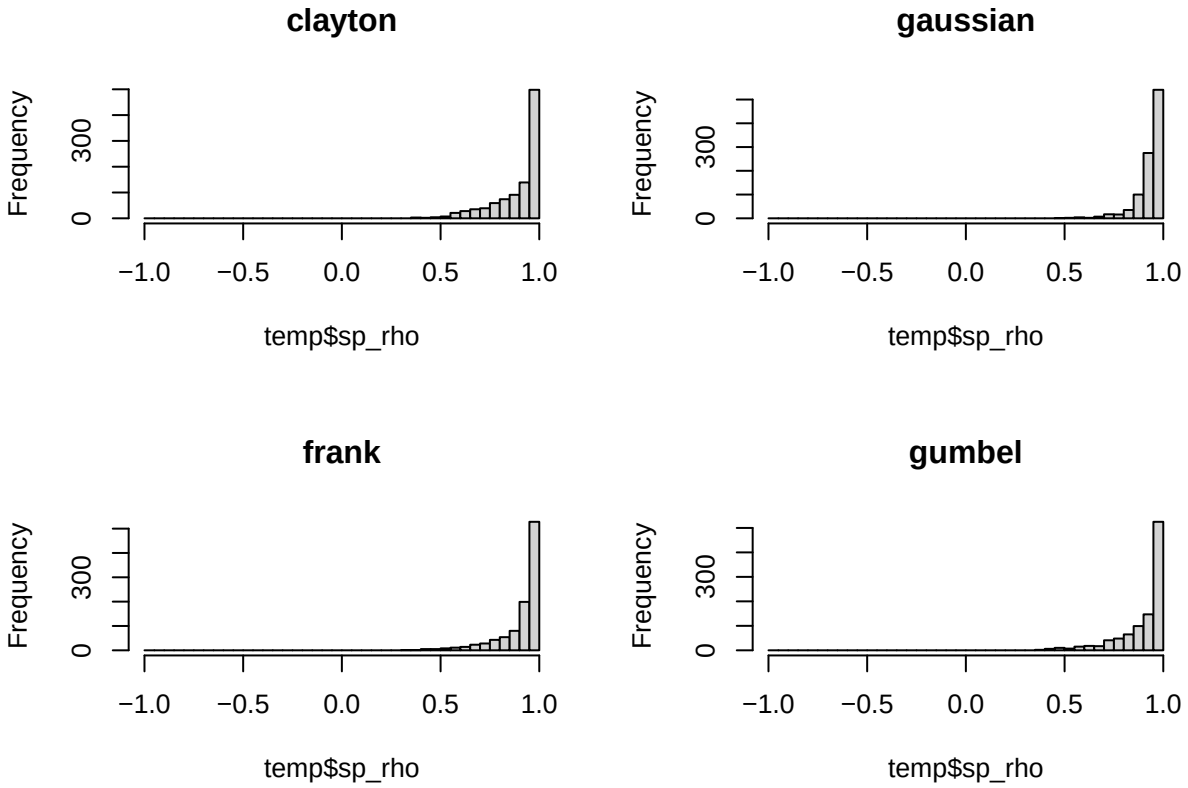
With time ordering

The marginal parameters should be determined such that around 20% of the observations are censored by death. This is a more or less realistic situation, but could be varied.

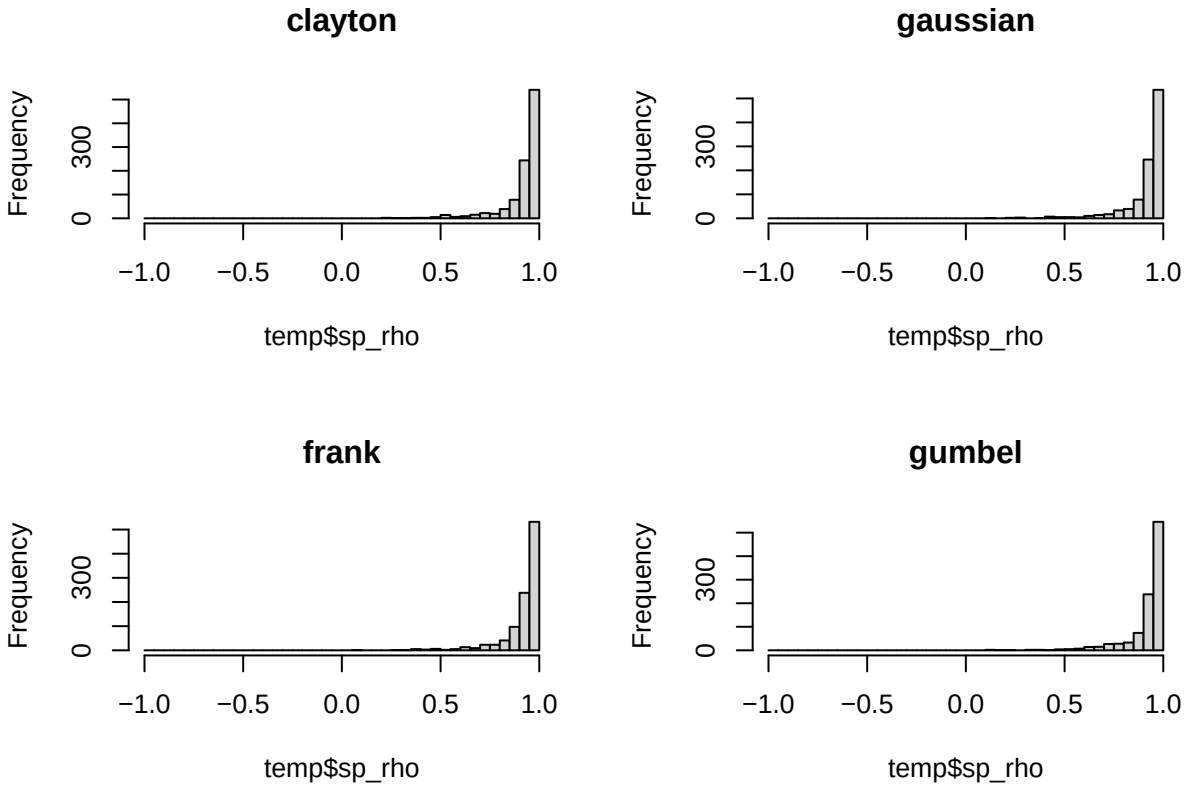
Strong

```
## [1] 0.1452
```

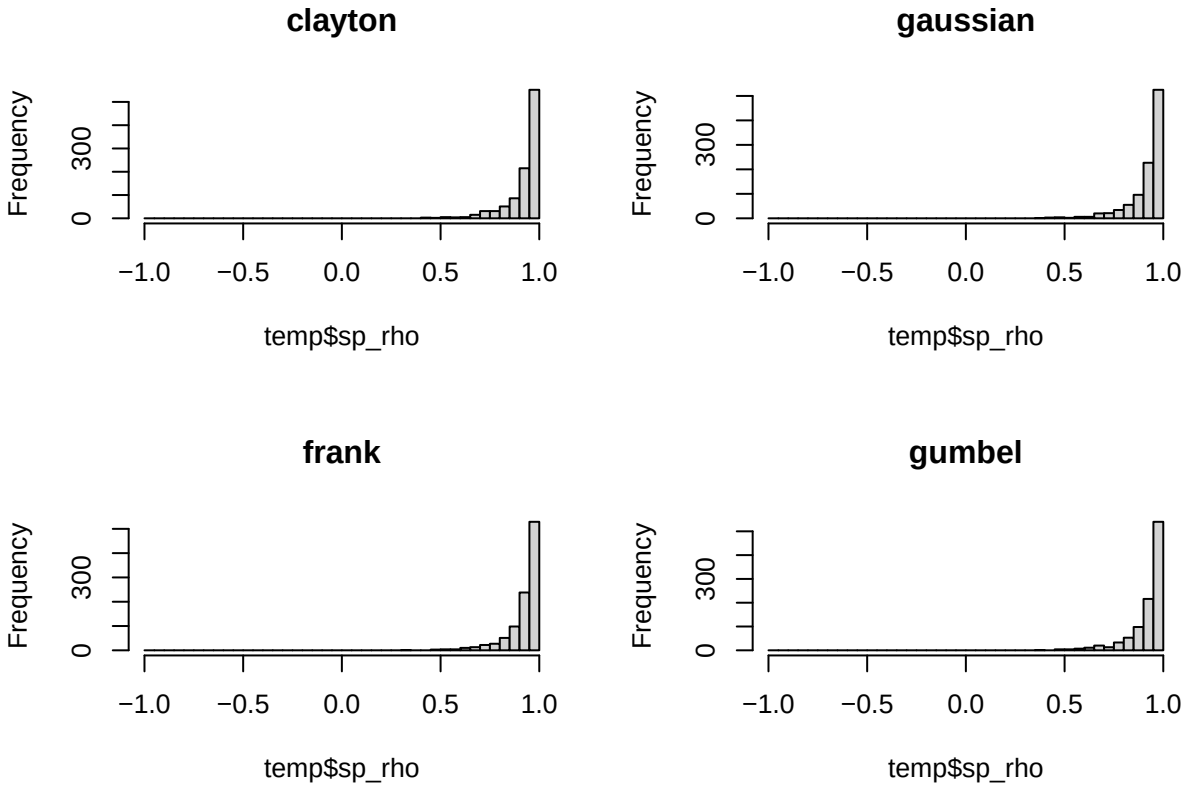
```
## [1] 0.1486
```




```
## # A tibble: 4 x 8
##   unid       min   max  mean median    p1   p99     sd
##   <chr>    <dbl> <dbl> <dbl>  <dbl> <dbl> <dbl>  <dbl>
## 1 clayton  0.362 0.997 0.889  0.949 0.525 0.996 0.120
## 2 frank    0.337 0.996 0.907  0.954 0.498 0.995 0.109
## 3 gaussian 0.476 0.995 0.932  0.953 0.677 0.991 0.0661
## 4 gumbel   0.351 0.997 0.898  0.953 0.458 0.996 0.118
```




```
## # A tibble: 4 x 8
##   unid        min   max  mean median    p1   p99    sd
##   <chr>     <dbl> <dbl> <dbl>  <dbl> <dbl> <dbl> <dbl>
## 1 clayton  0.232  0.996 0.915  0.953 0.483 0.994 0.108
## 2 frank    0.0791 0.995 0.916  0.953 0.431 0.991 0.103
## 3 gaussian 0.116  0.997 0.915  0.953 0.421 0.994 0.110
## 4 gumbel   0.133  0.996 0.915  0.955 0.481 0.994 0.109
```

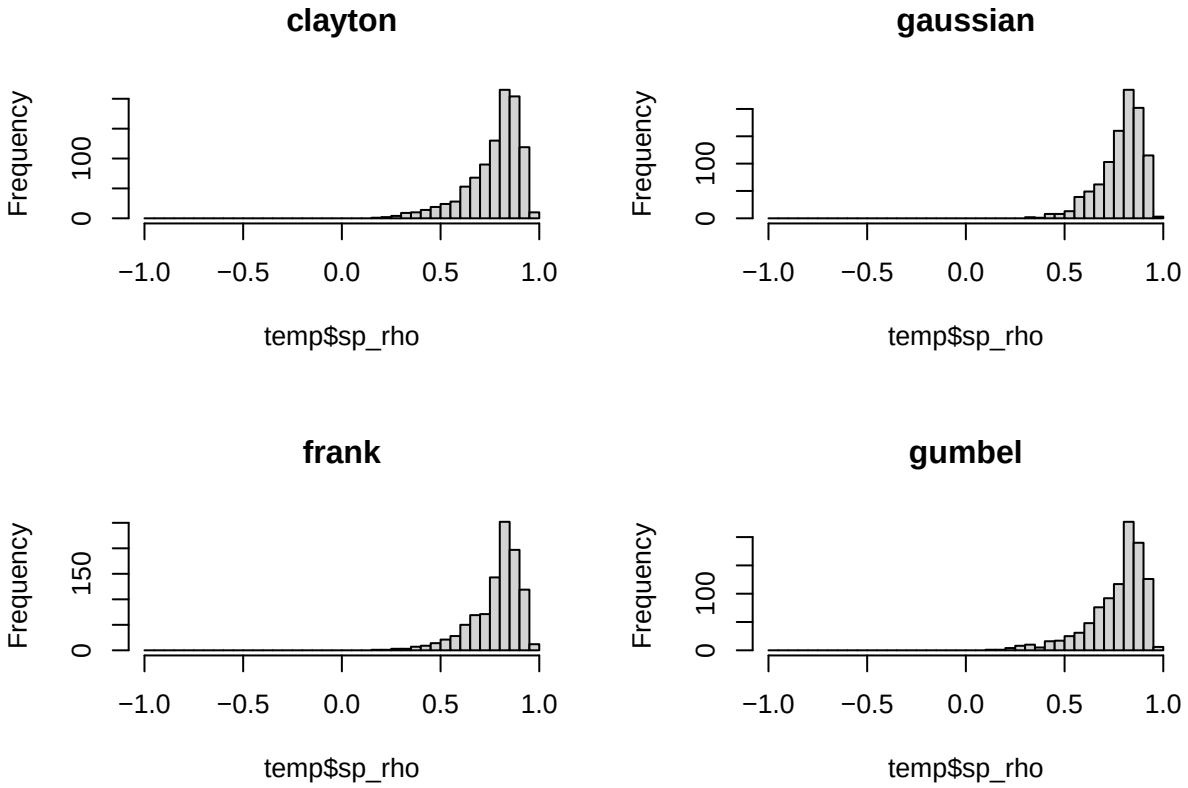



```
## # A tibble: 4 x 8
##   unid       min   max  mean median    p1   p99     sd
##   <chr>    <dbl> <dbl> <dbl>  <dbl> <dbl> <dbl>  <dbl>
## 1 clayton  0.413 0.995 0.920  0.954 0.559 0.992 0.0881
## 2 frank    0.350 0.995 0.922  0.954 0.571 0.993 0.0851
## 3 gaussian 0.357 0.997 0.918  0.952 0.553 0.993 0.0905
## 4 gumbel   0.384 0.997 0.919  0.953 0.569 0.994 0.0891
```

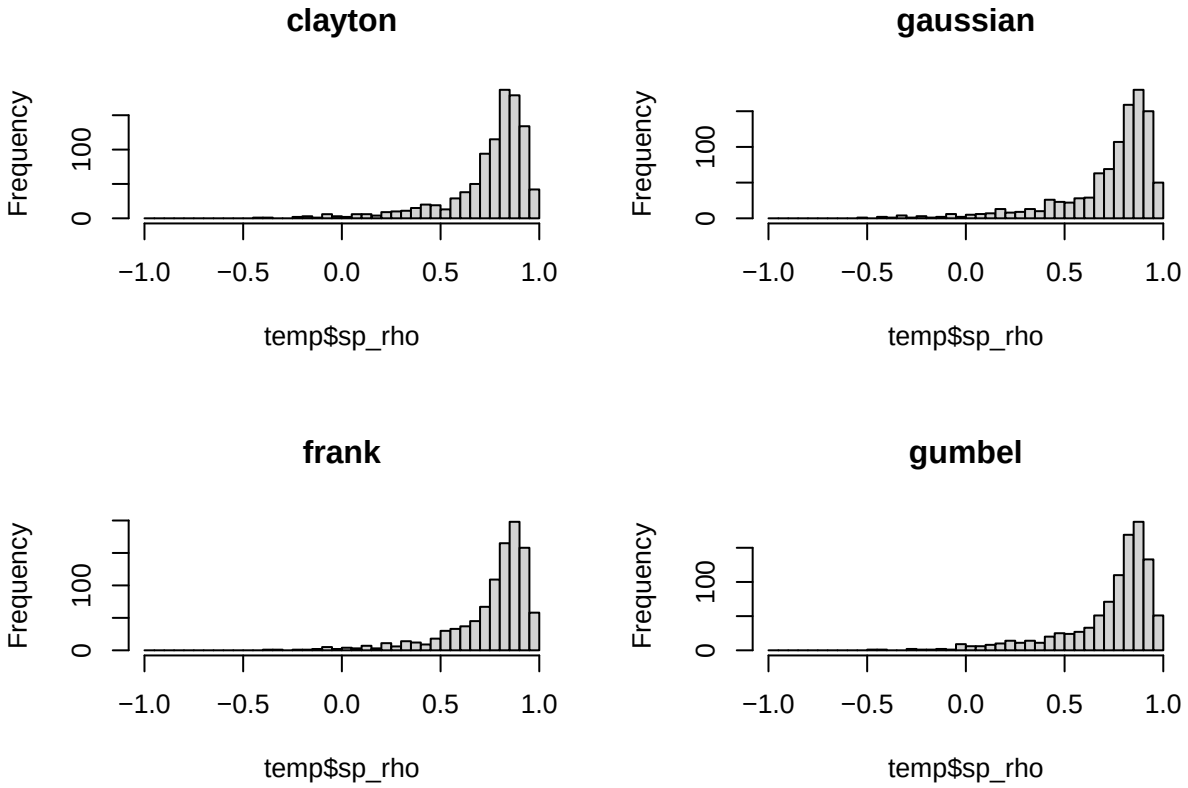
Moderate

```
## [1] 0.1574
```

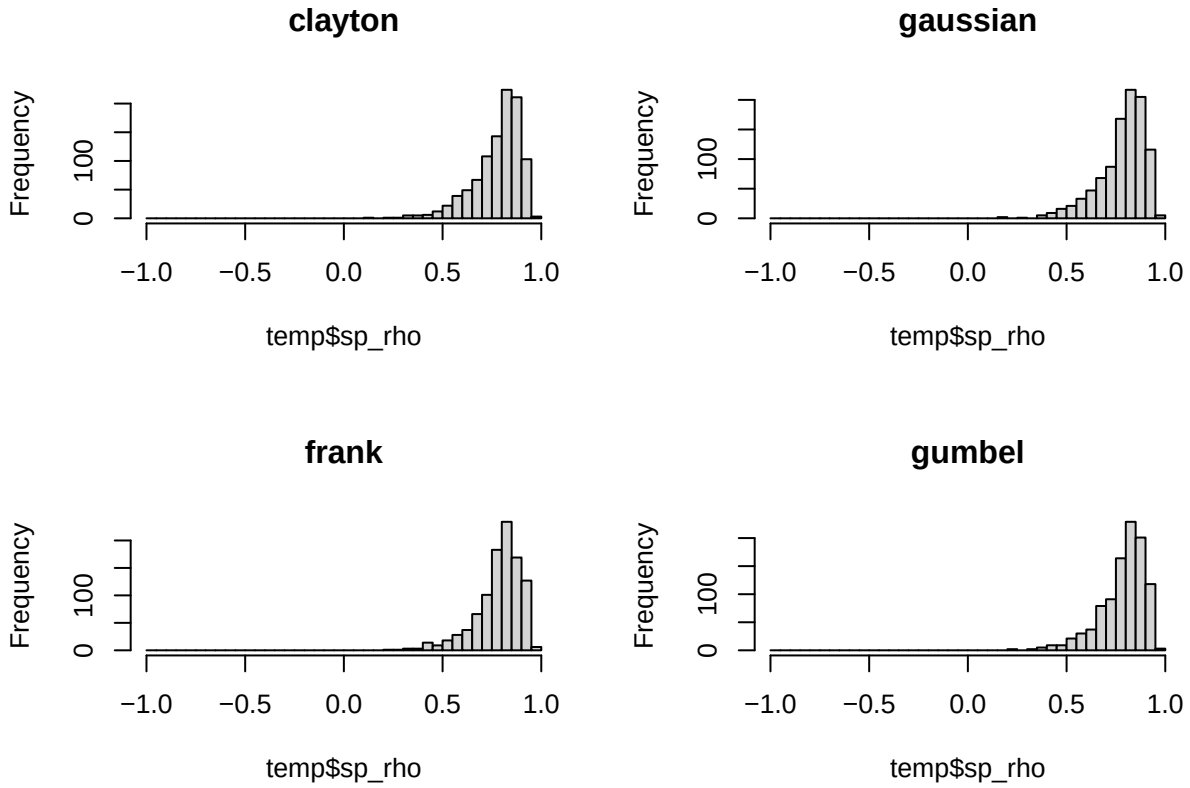
```
## [1] 0.146
```




```
## # A tibble: 4 x 8
##   unid       min   max  mean median    p1   p99    sd
##   <chr>    <dbl> <dbl> <dbl>  <dbl> <dbl> <dbl> <dbl>
## 1 clayton  0.168 0.969 0.772  0.810 0.325 0.950 0.139
## 2 frank    0.158 0.958 0.785  0.817 0.375 0.951 0.124
## 3 gaussian 0.315 0.957 0.788  0.813 0.449 0.941 0.108
## 4 gumbel   0.121 0.966 0.769  0.813 0.273 0.949 0.144
```




```
## # A tibble: 4 x 8
##   unid        min   max  mean median      p1   p99    sd
##   <chr>     <dbl> <dbl> <dbl>  <dbl>   <dbl> <dbl> <dbl>
## 1 clayton  -0.430 0.988 0.745  0.814 -0.0861 0.969 0.214
## 2 frank    -0.370 0.988 0.759  0.826 -0.0592 0.974 0.208
## 3 gaussian -0.506 0.993 0.731  0.817 -0.235  0.982 0.245
## 4 gumbel   -0.468 0.986 0.733  0.819 -0.0424 0.975 0.232
```

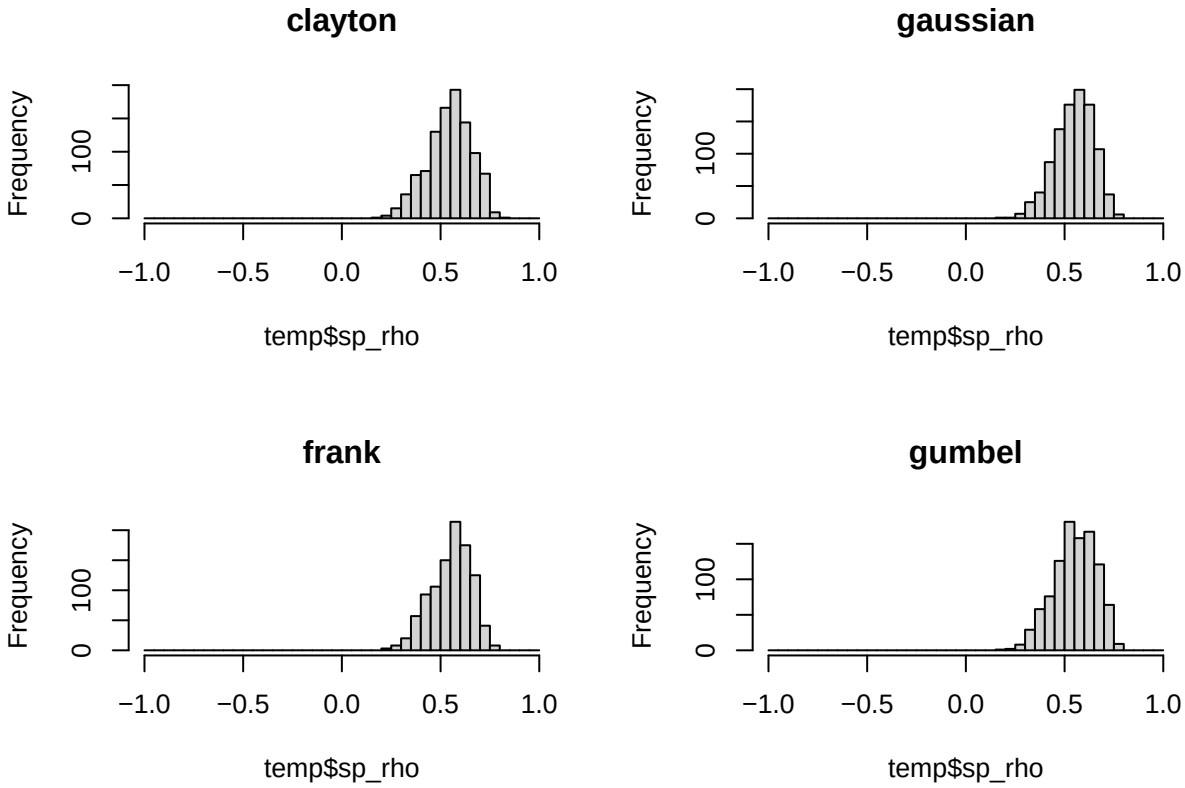



```
## # A tibble: 4 x 8
##   unid       min   max  mean median    p1   p99    sd
##   <chr>    <dbl> <dbl> <dbl>  <dbl> <dbl> <dbl> <dbl>
## 1 clayton  0.109 0.964 0.779  0.810 0.370 0.940 0.121
## 2 frank    0.228 0.962 0.786  0.810 0.413 0.943 0.115
## 3 gaussian 0.186 0.962 0.784  0.813 0.411 0.946 0.119
## 4 gumbel   0.222 0.952 0.786  0.809 0.407 0.942 0.114
```

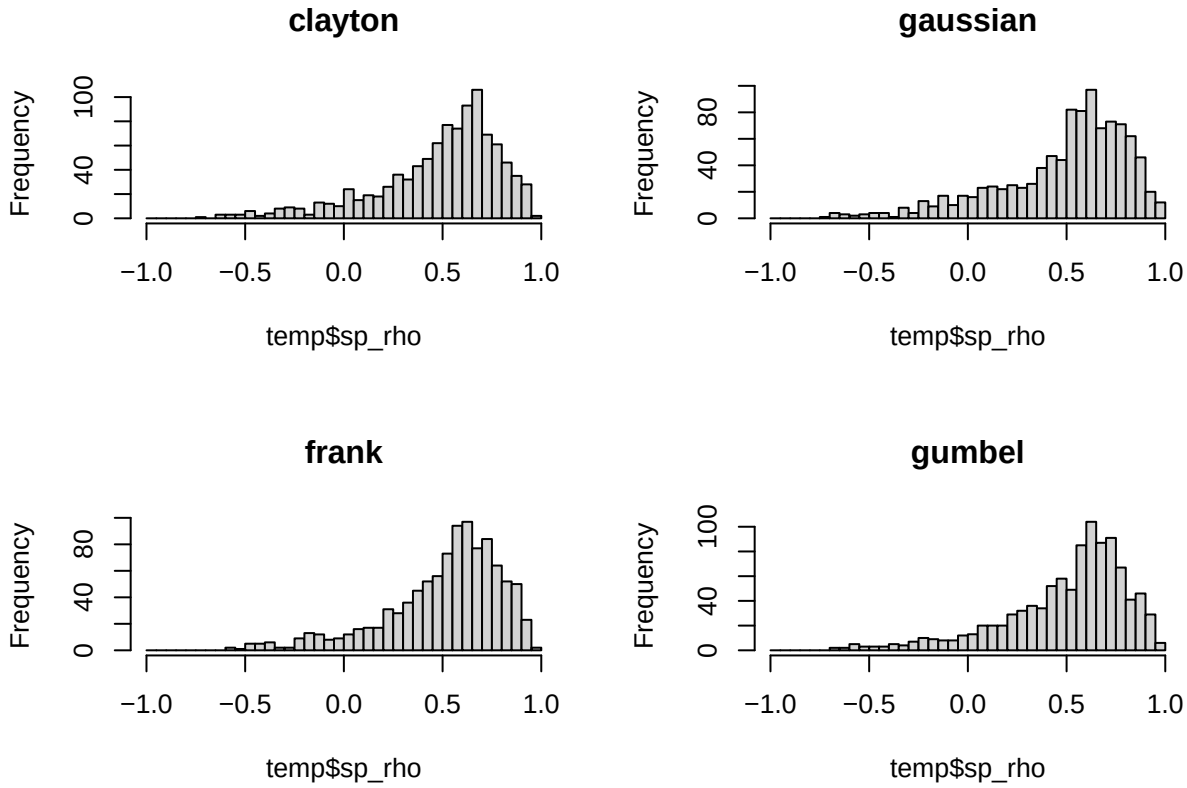
Weak

```
## [1] 0.1542
```

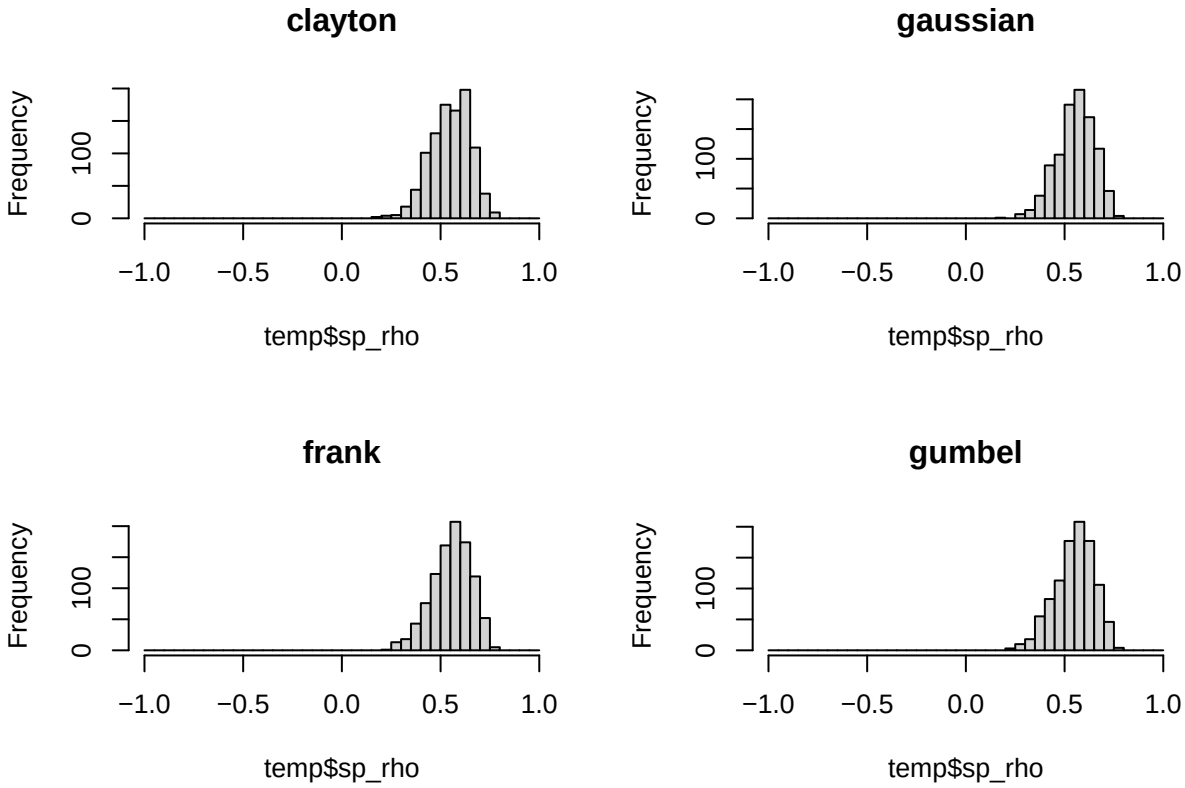
```
## [1] 0.1673
```




```
## # A tibble: 4 x 8
##   unid       min   max  mean median    p1   p99     sd
##   <chr>    <dbl> <dbl> <dbl>  <dbl> <dbl> <dbl>  <dbl>
## 1 clayton  0.163 0.809 0.544  0.553 0.273 0.748 0.111
## 2 frank    0.234 0.765 0.552  0.563 0.297 0.732 0.101
## 3 gaussian 0.184 0.770 0.549  0.556 0.304 0.737 0.0980
## 4 gumbel   0.192 0.784 0.551  0.556 0.297 0.747 0.107
```




```
## # A tibble: 4 x 8
##   unid        min   max  mean median     p1   p99    sd
##   <chr>     <dbl> <dbl> <dbl>  <dbl>  <dbl> <dbl> <dbl>
## 1 clayton  -0.714 0.952 0.485  0.559 -0.482 0.925 0.310
## 2 frank    -0.594 0.955 0.508  0.574 -0.423 0.927 0.294
## 3 gaussian -0.702 0.978 0.487  0.569 -0.535 0.952 0.328
## 4 gumbel   -0.693 0.975 0.500  0.582 -0.509 0.940 0.312
```




```
## # A tibble: 4 x 8
##   unid       min   max  mean median    p1   p99     sd
##   <chr>    <dbl> <dbl> <dbl>  <dbl> <dbl> <dbl>  <dbl>
## 1 clayton  0.172 0.787 0.548  0.556 0.285 0.742 0.101
## 2 frank    0.225 0.778 0.554  0.564 0.294 0.733 0.0997
## 3 gaussian 0.187 0.766 0.556  0.565 0.305 0.743 0.0953
## 4 gumbel   0.230 0.782 0.550  0.559 0.295 0.735 0.100
```