

CODECHECK certificate 2026-023

<https://doi.org/10.5281/zenodo.22094773>



Item	Value
Title of checked publication	Circadian timing does not modulate human temporal contrast sensitivity
Author(s)	Hannah Sophie Heinrichs  , Manuel Spitschan 
Reference	https://doi.org/10.1101/2025.11.10.687546
Codechecker(s)	Stephen J. Eglen 
Date of check	2026-08-21 10:00:00
Summary	R scripts and Python notebooks.
Repository	https://github.com/codecheckers/HeinrichsEtAl_JVis_2026

Table 1: CODECHECK summary

Summary

The bulk of this project is a set of Rscripts. There is also a python package that comes in the authors' repository, and some Jupyter notebooks. There was some work involved to reproduce the environment on my machine (a mac laptop). However, following feedback with the authors, these issues were resolved.

Output	Comment	Size (b)
results/figures/hormones/descriptives/img_melatonin_overview_figure.pdf	Figure 2 of manuscript (made using plot_hormone_overview.py)	46084
results/tables/log_tcs/codecheck_tbl_hormone_stats.pdf	Table 5 of manuscript	33581
results/tables/log_tcs/codecheck_tbl_descriptives_ntcstests.pdf	Table 6 of manuscript	38381
results/figures/hormones/tau_harmonics/fig_melatonin_scatterfunc.pdf	Figure A1 of manuscript	49577
results/figures/hormones/tau_harmonics/fig_melatonin_tau_gof.pdf	Figure A2 of manuscript	330886
results/tables/log_tcs/codecheck_tbl_descriptives_tcs.pdf	Table 7 of manuscript	21624
results/figures/tcs/fig_psychophysics_test_timeseries_212-2.pdf	Figure 3 of manuscript (from descriptives.ipynb)	26660
reports/fig/tcs/img_metropsis_blocks_group.pdf	Figure 4A of manuscript (from descriptives.ipynb)	27254

Table 2: Summary of output files generated

CODECHECKER notes

This codecheck was completed over two distinct sessions. In session 1, late July 2026, I hit two key problems with running the R code.

Package installation

The authors had used `renv` to document their package requirements. Although `renv` is a useful system, I feel it is best used to document what packages were used by the author, rather than reinstalling the same environment on my system. I had hoped that `renv` could install all the required dependencies, but it failed, presumably because i had unmet system dependencies outside of R. This includes, for example, the version of R used. (The version of R used by the authors was older than mine.)

I therefore took the `renv.lock` and manually installed all the packaged using `pak`. See the file `codecheck/installs.R`.

To disable the use of `renv`, I needed to delete the `rscripts/.Rprofile` file.

Running the main Rscript took about 31 minutes, with output saved in `codecheck/Rscript-output.txt`. Some of the outputs created were custom latex files; these were created to pdf using a script called `make_table.py`. Note: in these `.tex` files there were four undefined tex macros which were substituted with placeholders:

```
\providecommand{\ach}[1]{#1}  
\providecommand{\by}[1]{#1}  
\providecommand{\rg}[1]{#1}  
\providecommand{\ac}[1]{#1}
```

ggplot issues

`ggplot` was not working due to version incompatibilities. Fortunately, these were easy for Claude code to fix (see `claude-codecheck-summary.pdf` in my repo). I then passed these fixes back to the authors for consideration.

Repository

The repository was updated in early August, and so I restarted the codecheck. Fortunately, thanks to the issues found before, the code worked first time.

Python notebooks

One small issue was found with the `descriptive.ipynb` notebook: `PROJECT_ROOT` was not defined for me, so I made a small edit (see my version of the notebook).

Missing tables/figures

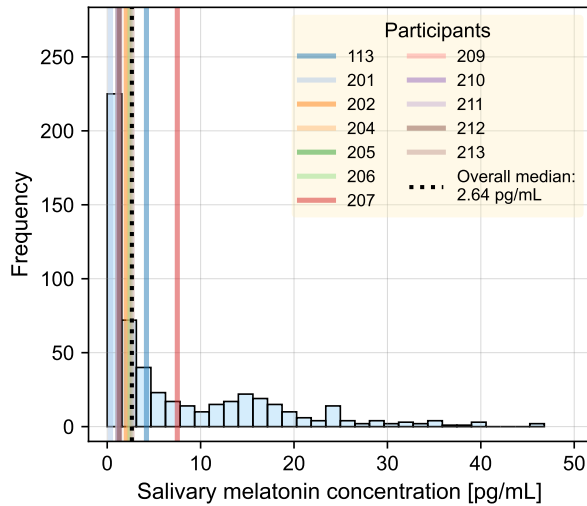
I was unable to locate where all of the tables/figures present in the manuscript were generated. Most notably, I could not find the source for Figure 4B, or Figure 5. However, there was enough to justify writing this certificate as a pass.

Manifest files

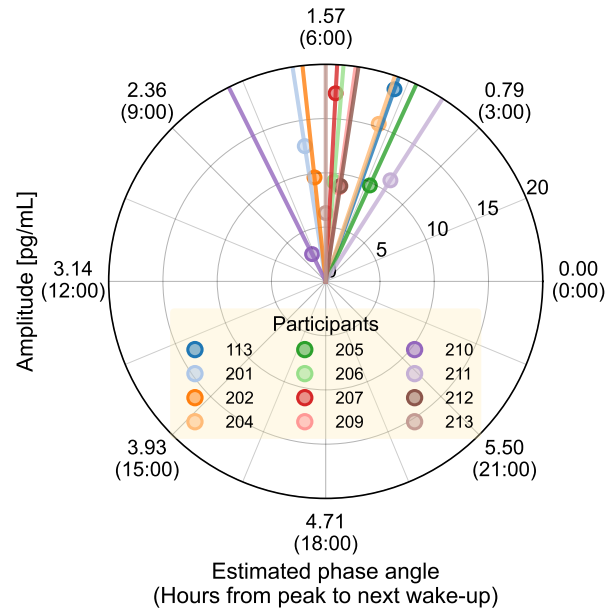
img_melatonin_overview_figure.pdf

Comment: Figure 2 of manuscript (made using plot_hormone_overview.py)

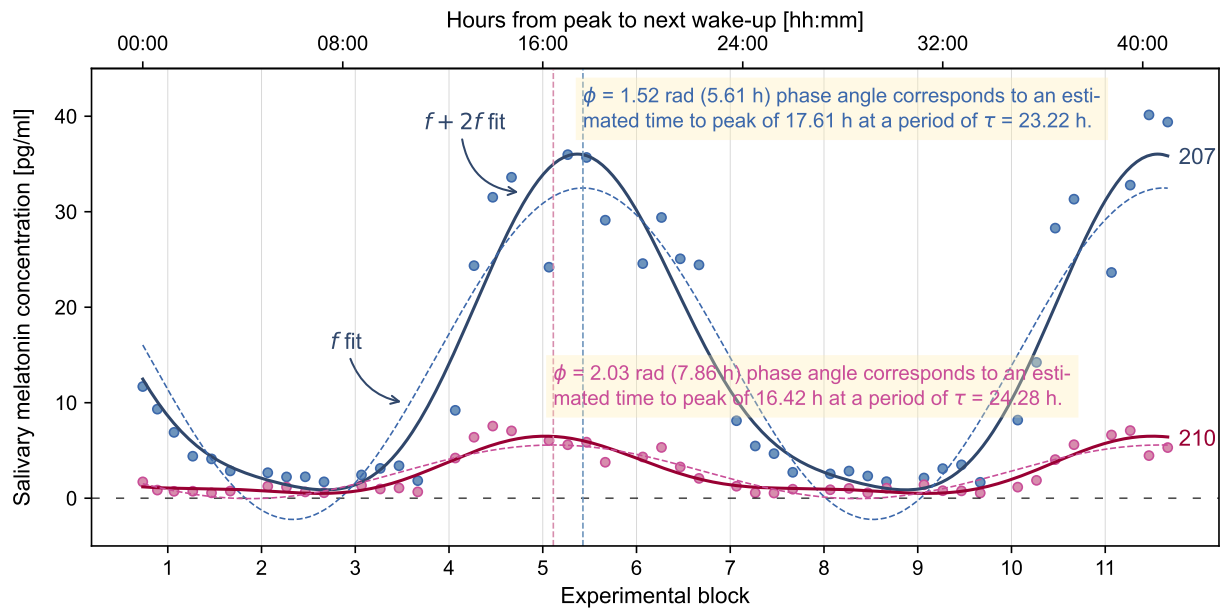
A Global distribution and median levels



B Amplitude and phase by participant



C Example concentrations profiles of two participants across 41 hours



codecheck_tbl_hormone_stats.pdf

Comment: Table 5 of manuscript

Table 1: Results from best fitting participant-specific model on saliva melatonin data when iterating over τ s; optimal τ and AIC , as well as calculated circadian parameters listed.

Participant	Optimal tau	\$AIC\$	Intercept	Fundamental		2nd harmonic	
				Amplitude (1st)	Phase (1st)	Amplitude (2nd)	Phase (2nd)
113	24.48	284.80	15.83	18.80	1.23	6.12	2.84
201	24.63	235.21	8.55	12.61	1.72	4.76	-2.52
202	24.65	201.16	7.68	9.63	1.68	2.26	-2.62
204	24.07	234.65	11.31	15.31	1.25	5.20	2.88
205	24.10	178.99	6.52	9.73	1.14	4.17	2.43
206	24.35	211.76	7.58	9.22	1.49	2.18	-2.99
207	23.22	266.96	15.13	17.36	1.52	3.62	-2.98
209	24.22	183.41	6.17	8.75	1.43	2.98	3.04
210	24.28	126.68	2.77	2.81	2.03	0.94	-1.92
211	23.92	164.91	7.25	11.06	1.00	5.15	2.08
212	23.90	233.47	6.84	8.89	1.42	2.07	-3.10
213	24.32	152.24	5.53	6.30	1.57	1.96	-2.55
$M(SD)$	24.18 (0.39)	206.19 (47.21)	8.43 (3.84)	10.87 (4.55)	1.46 (0.27)	3.45 (1.62)	-3.07 (0.60)

codecheck_tbl_descriptives_ntcstests.pdf

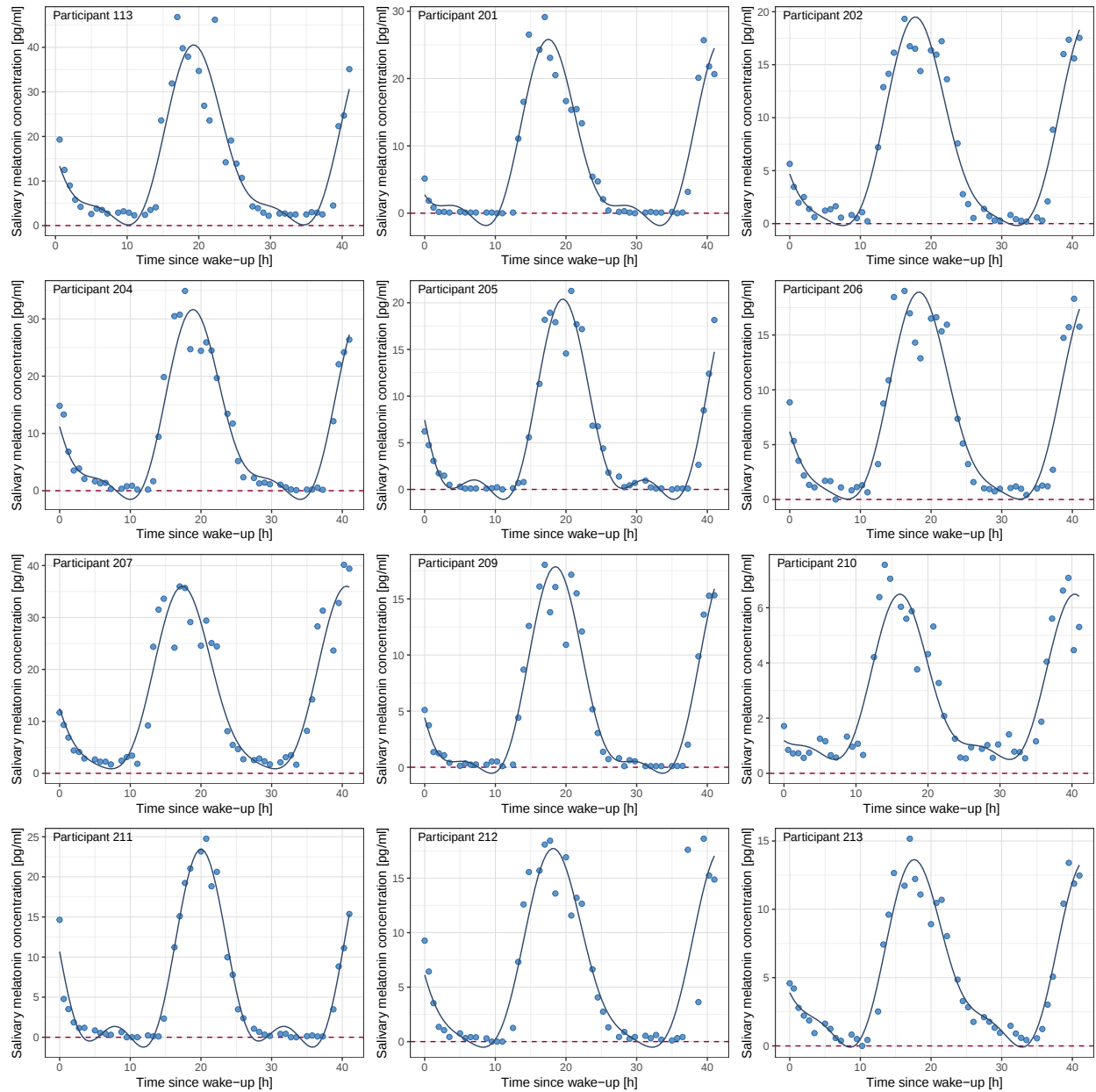
Comment: Table 6 of manuscript

Table 1: Deviations in test count for temporal contrast sensitivity in each colour direction. Each participant needed to complete three tests per colour direction per block. Table only contains test count per participant per experimental blocks, when there were either more or less than three tests in at least one colour direction.

N_{Tests}	Participant ID	Experimental Block	Postreceptoral mechanism		
			L+M+S (luminance)	S (blue-yellow)	L-M (red-green)
6	113	0	2	2	2
7	113	8	2	3	2
8	113	9	3	2	3
	202	1	3	3	2
	206	4	3	2	3
	211	1	3	3	2
	211	9	2	3	3
	212	1	3	3	2
	212	9	3	3	2
	213	6	3	3	2
	213	10	3	3	2
10	201	1	3	4	3
	202	6	3	4	3
	202	8	3	3	4
	204	7	3	3	4
	206	1	4	3	3
	209	5	3	4	3
	212	2	3	3	4

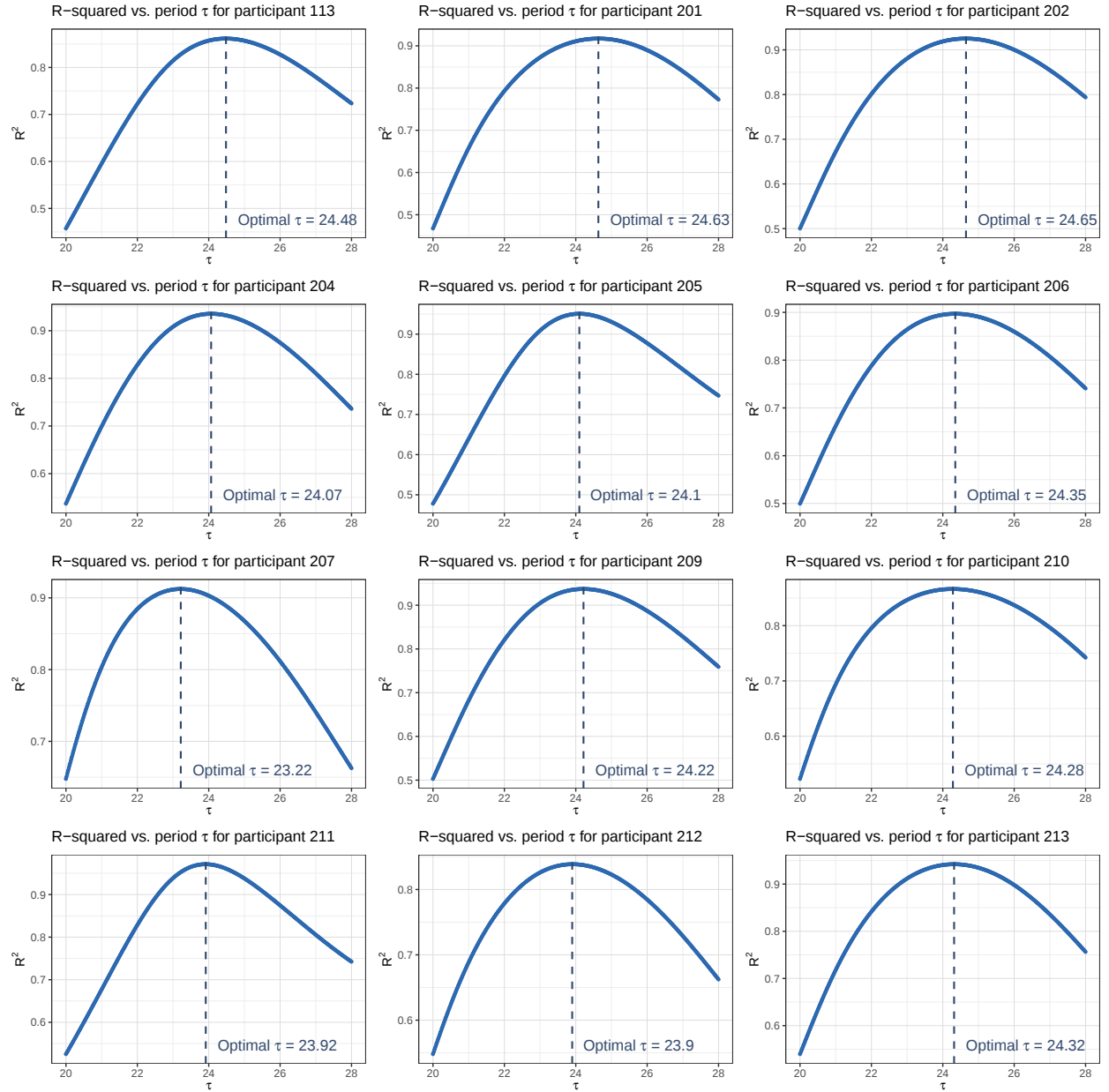
fig_melatonin_scatter-func.pdf

Comment: Figure A1 of manuscript



fig_melatonin_tau_gof.pdf

Comment: Figure A2 of manuscript



codecheck_tbl_descriptives_tcs.pdf

Comment: Table 7 of manuscript

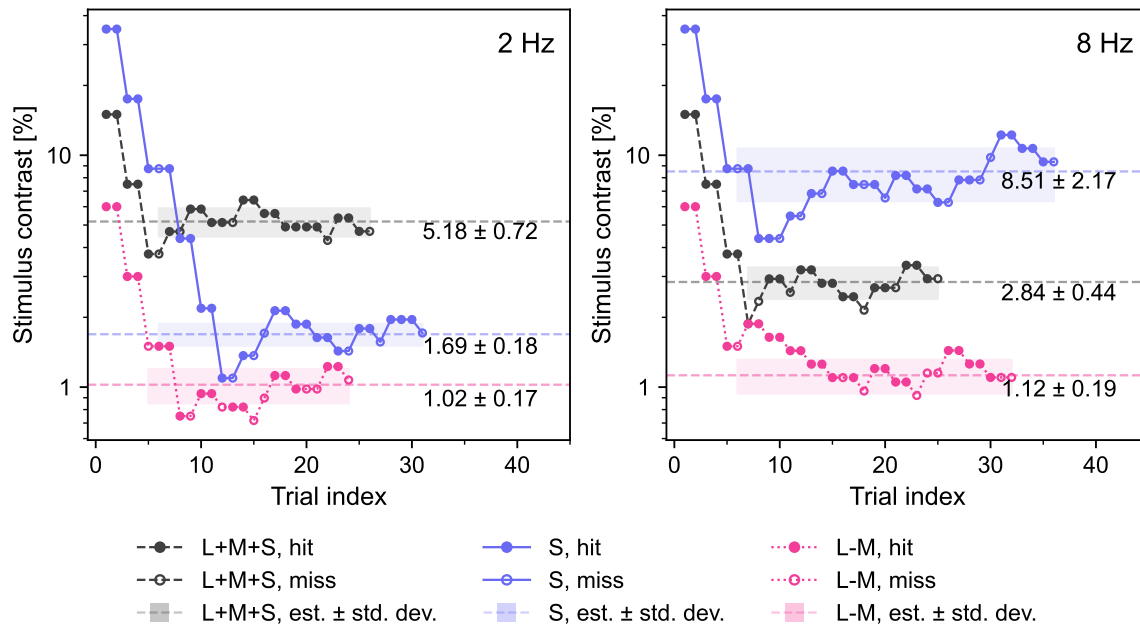
Table 1: Descriptive statistics of temporal contrast sensitivity tasks; average contrast sensitivities per colour condition and frequency across participants and time.

Postreceptoral channel	Temporal frequency [Hz]	Temporal contrast sensitivity	
		Mean	Standard deviation
S (blue-yellow)	8	0.098	0.062
	2	0.175	0.118
L+M+S (luminance)	8	0.410	0.341
	2	0.177	0.136
L-M (red-green)	8	0.903	0.654
	2	1.191	0.870

fig_psychophysics_test_timeseries_212-2.pdf

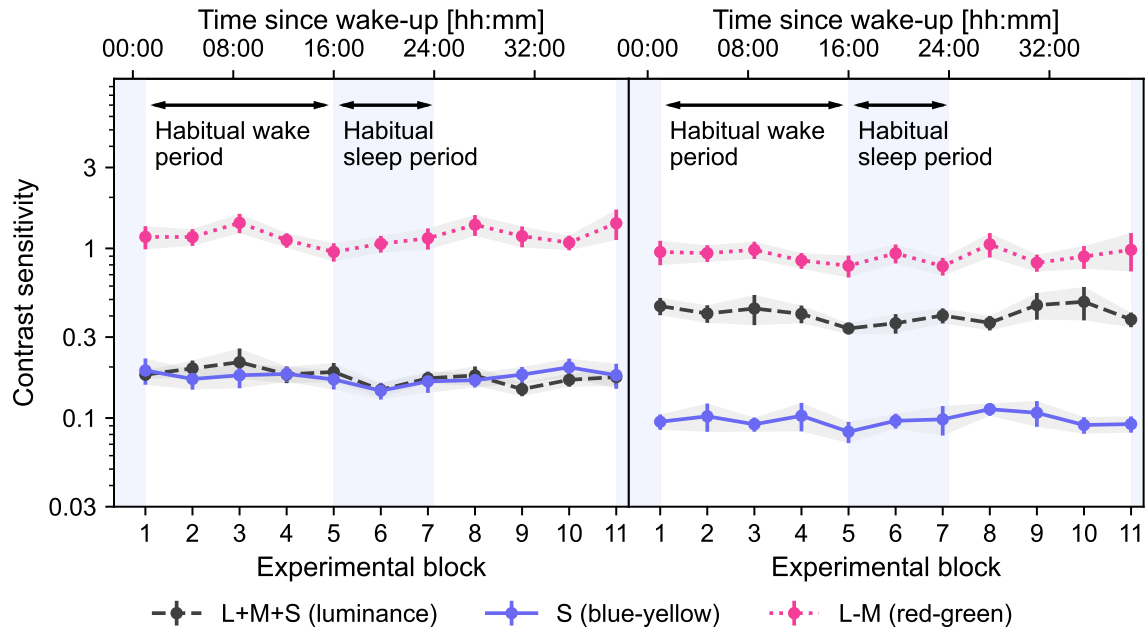
Comment: Figure 3 of manuscript (from descriptives.ipynb)

Psychophysical performance for tests of different colour directions



Comment: Figure 4A of manuscript (from descriptives.ipynb)

A Group data on psychophysical contrast sensitivities over time



Acknowledgements

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Citing this document

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About CODECHECK

This certificate confirms that the codechecker could independently reproduce the results of a computational analysis given the data and code from a third party. A CODECHECK does not check whether the original computation analysis is correct. However, as all materials required for the reproduction are freely available by following the links in this document, the reader can then study for themselves the code and data.

About this document

This document was created using R Markdown using the codecheck R package. `make codecheck.pdf` will regenerate the report file.

```
sessionInfo()
```

```
## R version 4.6.0 (2026-04-24)
## Platform: aarch64-apple-darwin23
## Running under: macOS Tahoe 26.6.2
##
## Matrix products: default
## BLAS:   /Library/Frameworks/R.framework/Versions/4.6/Resources/lib/libRblas.0.dylib
## LAPACK: /Library/Frameworks/R.framework/Versions/4.6/Resources/lib/libRlapack.dylib; LAPACK version
##
## locale:
## [1] en_GB.UTF-8/en_GB.UTF-8/en_GB.UTF-8/C/en_GB.UTF-8/en_GB.UTF-8
##
## time zone: Europe/London
## tzcode source: internal
##
## attached base packages:
## [1] stats      graphics  grDevices  utils      datasets
## [6] methods    base
##
## other attached packages:
## [1] readr_2.2.0      tibble_3.3.1
## [3] xtable_1.8-8     yaml_2.3.12
## [5] rprojroot_2.1.1  knitr_1.51
## [7] codecheck_0.25.0.9000 parsedate_1.3.2
## [9] R.cache_0.17.0   gh_1.6.1
##
## loaded via a namespace (and not attached):
## [1] utf8_1.2.6      generics_0.1.4  xml2_1.6.0
## [4] zen4R_0.10.6    stringi_1.8.9   httpcode_0.3.0
## [7] hms_1.1.4       digest_0.6.39   magrittr_2.0.5
```

```

## [10] evaluate_1.0.5    fastmap_1.2.0    plyr_1.8.9
## [13] cellranger_1.1.0  R.oo_1.27.1     jsonlite_2.0.0
## [16] R.utils_2.13.0    whisker_0.4.1    crul_1.6.0
## [19] urltools_1.7.3.1  httr_1.4.8       purrr_1.2.2
## [22] XML_3.99-0.23     cli_3.6.6        pdftools_3.9.0
## [25] rlang_1.3.0       triebeard_0.4.1  R.methodsS3_1.8.2
## [28] cachem_1.1.0      otel_0.2.0       tools_4.6.0
## [31] tzdb_0.5.0        memoise_2.0.1    dplyr_1.2.1
## [34] curl_7.1.0        vctrs_0.7.3      R6_2.6.1
## [37] lifecycle_1.0.5   magick_2.9.1     git2r_0.36.2
## [40] stringr_1.6.0     rsvg_2.7.0       fs_2.1.0
## [43] pkgconfig_2.0.3   rorcid_0.7.0     osfr_0.2.9
## [46] pillar_1.11.1     glue_1.8.1       Rcpp_1.1.2
## [49] xfun_0.60         tidyselect_1.2.1 keyring_1.4.1
## [52] htmltools_0.5.9   rmarkdown_2.31   qpdf_1.4.1
## [55] compiler_4.6.0    askpass_1.2.1    fauxpas_0.6.0
## [58] readxl_1.5.0

```