

Example with new-ish version of R (4.5.2) and new-ish version of OpenMx (2.22.10).

```
# some utility functions I'm using... be nice, I never got around to polishing these much...
# which was what I was hoping to do.
# devtools::install_github("falkcarl/mpirt")
library(mpirt)

library(microbenchmark)

library(psych) # uh, for some data
data(bfi)
dat <- bfi[,1:25]
dat.openmx <- mxFactor(dat, levels=1:6)
ni <- ncol(dat.openmx) # number of items

# This should default to GRMP, but with 1st order polynomial = Graded response model
fitk0 <- fitMP(dat.openmx, se=FALSE)

## Code I would like to run; but by the second fitted model it's already too slow

## Use simulated annealing to obtain MP-based model
## set up matrix to store possible polynomial orders
# kmat <- newkmat(0,3,ni) #k = 3 -> 7th order polynomial
#
# # Same priors used (tau=-1, variance of 500) as in GRMP paper (Falk, 2020)
# set.seed(1938)
# sa.result <- simAnneal(dat.openmx, kmat, itemtype=rep("grmp",ni), itermax=1200,
#                         inittemp=5, type="aic", pvar=500, taumean=-1, temptype="logarithmic",
#                         items=1)

## Example of a slow-ish model
# This will return an MxModel object, but fitting is a bit "slow"

fitmodel <- fitMP(dat.openmx, k = c(1,rep(0,24)), fit = TRUE, itemtype = rep("grmp",ni),
                  priors = TRUE, startimat = fitk0$itemModel@matrices$item, qpoints = 101,
                  qwidth = 5, se = FALSE)

microbenchmark(
  fitMP(dat.openmx, k = c(1,rep(0,24)), fit = TRUE, itemtype = rep("grmp",ni),
        priors = TRUE, startimat = fitk0$itemModel@matrices$item, qpoints = 101,
        qwidth = 5, se = FALSE),
  times = 5
)
```

```
## Unit: seconds
```

```
##
```

```
## fitMP(dat.openmx, k = c(1, rep(0, 24)), fit = TRUE, itemtype = rep("grmp",      ni), priors = TRUE,
##      min      lq      mean      median      uq      max neval
## 11.84965 12.01945 12.03852 12.07673 12.10363 12.14313      5
```

```
devtools::session_info()
```

```
## - Session info -----
## setting value
## version R version 4.5.1 (2025-06-13 ucrt)
## os      Windows 10 x64 (build 19045)
```

```

## system    x86_64, mingw32
## ui        RTerm
## language  (EN)
## collate   English_Canada.utf8
## ctype     English_Canada.utf8
## tz        America/Toronto
## date      2026-04-28
## pandoc    3.6.3 @ C:/Program Files/RStudio/resources/app/bin/quarto/bin/tools/ (via rmarkdown)
## quarto    NA @ C:\\PROGRA~1\\RStudio\\RESOUR~1\\app\\bin\\quarto\\bin\\quarto.exe
##
## - Packages -----
## ! package      * version  date (UTC) lib source
##   cachem        1.1.0    2024-05-16 [1] CRAN (R 4.5.1)
##   cli           3.6.5    2025-04-23 [1] CRAN (R 4.5.1)
##   codetools     0.2-20   2024-03-31 [2] CRAN (R 4.5.1)
##   devtools     2.4.6    2025-10-03 [1] CRAN (R 4.5.1)
##   digest        0.6.37   2024-08-19 [1] CRAN (R 4.5.1)
##   dplyr         1.2.0    2026-02-03 [1] CRAN (R 4.5.3)
##   ellipsis      0.3.2    2021-04-29 [1] CRAN (R 4.5.1)
##   evaluate      1.0.5    2025-08-27 [1] CRAN (R 4.5.1)
##   farver        2.1.2    2024-05-13 [1] CRAN (R 4.5.1)
##   fastmap       1.2.0    2024-05-15 [1] CRAN (R 4.5.1)
##   fs            1.6.6    2025-04-12 [1] CRAN (R 4.5.1)
##   furr          * 0.3.1    2022-08-15 [1] CRAN (R 4.5.1)
##   future        * 1.67.0   2025-07-29 [1] CRAN (R 4.5.1)
##   generics      0.1.4    2025-05-09 [1] CRAN (R 4.5.1)
##   ggplot2       * 4.0.2    2026-02-03 [1] CRAN (R 4.5.3)
##   globals       0.18.0   2025-05-08 [1] CRAN (R 4.5.0)
##   glue          1.8.0    2024-09-30 [1] CRAN (R 4.5.1)
##   gtable        0.3.6    2024-10-25 [1] CRAN (R 4.5.1)
##   htmltools     0.5.8.1  2024-04-04 [1] CRAN (R 4.5.1)
##   httpuv        1.6.16   2025-04-16 [1] CRAN (R 4.5.1)
##   ifaTools      * 0.23     2022-01-19 [1] CRAN (R 4.5.2)
##   knitr         1.50     2025-03-16 [1] CRAN (R 4.5.1)
##   later         1.4.4    2025-08-27 [1] CRAN (R 4.5.1)
##   lattice       0.22-7   2025-04-02 [2] CRAN (R 4.5.1)
##   lifecycle     1.0.5    2026-01-08 [1] CRAN (R 4.5.3)
##   listenv       0.9.1    2024-01-29 [1] CRAN (R 4.5.1)
##   magrittr      2.0.4    2025-09-12 [1] CRAN (R 4.5.1)
##   MASS          7.3-65   2025-02-28 [2] CRAN (R 4.5.1)
##   Matrix        1.7-3    2025-03-11 [2] CRAN (R 4.5.1)
##   memoise       2.0.1    2021-11-26 [1] CRAN (R 4.5.1)
##   microbenchmark * 1.5.0    2024-09-04 [1] CRAN (R 4.5.2)
##   mime          0.13     2025-03-17 [1] CRAN (R 4.5.0)
##   mnormt        2.1.1    2022-09-26 [1] CRAN (R 4.5.0)
##   mpirt         * 0.1.1    2025-11-18 [1] local
##   multcomp      1.4-29   2025-10-20 [1] CRAN (R 4.5.2)
##   mvtnorm       1.3-3    2025-01-10 [1] CRAN (R 4.5.1)
##   nlme          3.1-168  2025-03-31 [2] CRAN (R 4.5.1)
##   OpenMx        * 2.22.10  2025-11-07 [1] CRAN (R 4.5.2)
##   parallelly    1.45.1   2025-07-24 [1] CRAN (R 4.5.1)
##   pillar        1.11.1   2025-09-17 [1] CRAN (R 4.5.1)
##   pkgbuild      1.4.8    2025-05-26 [1] CRAN (R 4.5.1)
##   pkgconfig     2.0.3    2019-09-22 [1] CRAN (R 4.5.1)

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## pkgload      1.4.1    2025-09-23 [1] CRAN (R 4.5.1)
## plyr         1.8.9    2023-10-02 [1] CRAN (R 4.5.1)
## promises    1.3.3    2025-05-29 [1] CRAN (R 4.5.1)
## psych       * 2.5.6    2025-06-23 [1] CRAN (R 4.5.1)
## purrr       1.2.1    2026-01-09 [1] CRAN (R 4.5.3)
## R6          2.6.1    2025-02-15 [1] CRAN (R 4.5.1)
## RColorBrewer 1.1-3    2022-04-03 [1] CRAN (R 4.5.0)
## Rcpp        1.1.1    2026-01-10 [1] CRAN (R 4.5.2)
## D RcppParallel 5.1.11-1 2025-08-27 [1] CRAN (R 4.5.1)
## remotes     2.5.0    2024-03-17 [1] CRAN (R 4.5.1)
## reshape2   * 1.4.4    2020-04-09 [1] CRAN (R 4.5.1)
## rlang       1.1.7    2026-01-09 [1] CRAN (R 4.5.3)
## rmarkdown   2.30     2025-09-28 [1] CRAN (R 4.5.1)
## rpf         * 1.0.15   2025-05-04 [1] CRAN (R 4.5.1)
## rstudioapi  0.17.1   2024-10-22 [1] CRAN (R 4.5.1)
## S7          0.2.0    2024-11-07 [1] CRAN (R 4.5.1)
## sandwich    3.1-1    2024-09-15 [1] CRAN (R 4.5.2)
## scales      1.4.0    2025-04-24 [1] CRAN (R 4.5.1)
## sessioninfo 1.2.3    2025-02-05 [1] CRAN (R 4.5.1)
## shiny       * 1.11.1   2025-07-03 [1] CRAN (R 4.5.1)
## stringi     1.8.7    2025-03-27 [1] CRAN (R 4.5.0)
## stringr     1.5.2    2025-09-08 [1] CRAN (R 4.5.1)
## survival    3.8-3    2024-12-17 [2] CRAN (R 4.5.1)
## TH.data     1.1-5    2025-11-17 [1] CRAN (R 4.5.2)
## tibble      3.3.0    2025-06-08 [1] CRAN (R 4.5.1)
## tidyr       1.3.2    2025-12-19 [1] CRAN (R 4.5.3)
## tidyselect  1.2.1    2024-03-11 [1] CRAN (R 4.5.1)
## usethis     3.2.1    2025-09-06 [1] CRAN (R 4.5.1)
## vctrs       0.7.2    2026-03-21 [1] CRAN (R 4.5.3)
## withr       3.0.2    2024-10-28 [1] CRAN (R 4.5.1)
## xfun        0.53     2025-08-19 [1] CRAN (R 4.5.1)
## xtable      1.8-4    2019-04-21 [1] CRAN (R 4.5.1)
## yaml        2.3.10   2024-07-26 [1] CRAN (R 4.5.0)
## zoo         1.8-15   2025-12-15 [1] CRAN (R 4.5.2)

```

```

##
## [1] C:/Users/Carl F Falk/AppData/Local/R/win-library/4.5
## [2] C:/Program Files/R/R-4.5.1/library

```

```

##
## * -- Packages attached to the search path.
## D -- DLL MD5 mismatch, broken installation.
##

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```