

# Getting Started with Mplus Version 6.12 Demo for Mac OS X and Linux

This document shows how to install Mplus Demo, how to use Mplus Demo, and where to find additional documentation.

## Overview

Mplus Version 6.12 Demo is available for 32-bit and 64-bit Mac OS X and Linux operating systems. Mplus Demo for Mac OS X is available with the Mplus Editor. Mplus Demo for Linux operating systems is available only from the command line. Plot information produced by Mplus Demo can be read and plots made by the R program using the HDF5 package.

## Installation

### Installation on Mac OS X

Installation of Mplus Demo on Mac OS X runs in GUI mode. The default installation location is the /Applications/MplusDemo folder.

### Installation on Linux

Installation of Mplus on Linux operating systems runs in console mode by default. The installer can also be run in GUI or silent mode. To run the installer in GUI or silent mode, use the -i option as shown below:

- For GUI mode: `install_mplus -i gui`
- For silent mode: `install_mplus -i silent`

Note that installation in GUI mode requires that a Java virtual machine is installed. A Java VM pack is bundled with the installer but may not be compatible with certain Linux operating systems or computer architectures.

For all installations, the default installation directory is /opt/mplusdemo. Installing Mplus into the /opt directory requires root permissions. If this is the desired installation directory, execute the installer as root or with sudo.

### Environment Variables Set During Installation

The Mplus installation sets the following environment variables: PATH and TMPDIR. The PATH environment variable is required in order to refer to the Mplus executable without giving the full path of the installation directory. Mplus creates all temporary files in the directory pointed to by the TMPDIR environment variable. By default, the TMPDIR environment variable is set to the /tmp directory.

If the installer is executed as root or with sudo, then the installer will add the commands to set the environment variables to the system file /etc/profile for bash shell and /etc/.login for C shell. If the

installer is executed without root permissions, then either the file `.profile` (for bash shell) or `.cshrc` (for C shell) is updated with the new settings for the `PATH` and `TMPDIR` environment variables.

The following table summarizes these settings:

Running installer...	as root or with sudo	as non-root
For Bash shell	<code>/etc/profile</code>	<code>.profile</code>
For C shell	<code>/etc/.login</code>	<code>.cshrc</code>

Since the settings of these files are only applied during the login process, sourcing the specific file or re-logging in will apply the settings to any opened sessions.

The typical Mplus installation installs the Mplus executable file, the Mplus User's Guide in PDF format in the Documentation directory, and examples from the Mplus User's Guide in the Examples directory. When disk space is limited, install Mplus with the minimal option which will install all files except the Mplus examples. This option can be selected after running the Mplus installer.

### **Uninstalling Mplus**

To uninstall Mplus, execute the `uninstall_mplus` command in the `uninstall` directory in the Mplus installation directory. Note that if root permissions were used when installing Mplus, then the same permissions are required for uninstalling Mplus.

## **Running Mplus**

### **Running Mplus on Mac OS X**

Start the Mplus Editor for Mac OS X. The Mplus Editor can be found in the `/Applications/MplusDemo` folder. Create a new file by using the New option under the File menu or open an existing file by using the Open option under the File menu. To run Mplus, click on the Run button. The Mplus output file will be created in the folder where the input resides. When the Mplus run finishes, the output file will be opened in the Mplus Editor automatically.

The Mplus Editor features keyword highlighting of the Mplus commands.

For information on how to use Mplus from the command line on Mac OS X, please refer to the tutorial for using Mplus on Mac OS X on the Mplus website at [www.statmodel.com/mactutorial.shtml](http://www.statmodel.com/mactutorial.shtml).

### **Running Mplus from the Command Line on Linux**

Mplus Version 6.12 Demo is available for Linux operating systems from the command line.

Following are steps to use Mplus from the command line:

1. Open a command prompt.

2. Set the environment variables for Mplus (if not already set).
3. Run Mplus.

To run Mplus, type the following at the prompt

```
mpdemo <name-of-input-file>
```

substituting <name-of-input-file> with the name of the text file containing Mplus instructions that you wish to run. An output file with the same name as the input file but with the OUT extension will be created in this directory. The input files for the examples from the Mplus User's Guide have the extension INP. Mplus input files can be edited using any text editor.

## Environment Variables for Mplus

Mplus uses the following environment variables. For instructions on setting environment variables, refer to the section on [Setting Environment Variables](#).

If the **TMPDIR** environment variable is set, then all Mplus temporary files will be created in that directory. If TMPDIR is not set, then some Mplus temporary files will be created in the /tmp folder and others will be created in the directory where Mplus is running.

Other environment variables used by Mplus are: TERM, COLORTERM, MPLUS\_TERM, MPLUS\_TERM\_X, and MPLUS\_TERM\_T. Please refer to the section about [Multiple Processes in Mplus with PROCESSOR \(STARTS\)](#) for more information about how these variables are used.

## Stack Size and Mplus on Linux

Some Mplus runs may require a bigger stack size than the default stack size. These runs usually result in an incomplete output file and 'segmentation fault' appearing in the command prompt window. The stack size can be increased with the **ulimit** command in bash shell or the **limit** command in C shell. The default stack size varies. To check the stack size, use **ulimit -a** in bash shell or **limit stacksize** in C shell.

## Multiple Processes in Mplus with PROCESSOR (STARTS)

The default terminal program used by the PROCESSOR (STARTS) feature is determined from the setting for the **TERM** environment variable.

### Mac OS X

On Mac OS X, if the setting for the TERM environment variable is set to *xterm* or *xterm-color*, then the **xterm** will be used for the new Mplus processes. If TERM is not set to either of these settings, then the shell command interpreter sh will be used. This setting will not open a new window and screen printout from the Mplus processes will come out in no particular order.

The default terminal program for the PROCESSOR STARTS feature can be overridden by setting the **MPLUS\_TERM** environment variable. The setting for MPLUS\_TERM should point to the terminal program to use. The **MPLUS\_TERM\_X** environment variable must also be set to specify the execute option of the terminal program. The **MPLUS\_TERM\_T** environment variable can be set to specify the title option of the terminal program. The MPLUS\_TERM\_X variable is required if MPLUS\_TERM is set; the MPLUS\_TERM\_T variable is optional.

A special script, called startMplus, is provided in the Mplus installation directory for starting new Mplus processes with the Terminal application on Mac OS X. To use this script, set the MPLUS\_TERM variable to 'applescript' and both MPLUS\_TERM\_X and MPLUS\_TERM\_T to 'startMpus'. The new Terminal windows will not close by default when the new Mplus processes have terminated.

### Linux

For Linux operating systems, if the setting is equal to *xterm*, then the variable COLORTERM is checked. If the COLORTERM variable is set to *gnome-terminal*, then **gnome-terminal** (for GNOME desktops) will be used. If COLORTERM is set to *Terminal*, then **xfce4-terminal** (for Xfce desktops) will be used. If COLORTERM is not set or is set to something other than *gnome-terminal* and *Terminal*, then **xterm** will be used. If TERM is not set to *xterm*, then the shell command interpreter **sh** will be used. This setting will not open a new window and screen printout from the Mplus processes will come out in no particular order.

The default terminal program for the PROCESSOR STARTS feature can be overridden by setting the **MPLUS\_TERM** environment variable. The setting for MPLUS\_TERM should point to the terminal program to use. The recognized programs are: *gnome-terminal*, *konsole* (for KDE desktops), *xfce4-terminal*, and *xterm*. For all other terminal programs, the **MPLUS\_TERM\_X** environment variable must also be set to specify the execute option of the terminal program. The **MPLUS\_TERM\_T** environment variable can be set to specify the title option of the terminal program. The MPLUS\_TERM\_X variable is required if MPLUS\_TERM is set; the MPLUS\_TERM\_T variable is optional.

The following table summarizes which terminal programs will be used:

Environment Variable Settings	Terminal Program Used
TERM=xterm and COLORTERM=gnome-terminal	gnome-terminal
TERM=xterm and COLORTERM=Terminal	xfce4-terminal
TERM=xterm and COLORTERM=something else	Xterm
TERM=xterm and COLORTERM not set	Xterm
TERM=something else	Sh
TERM not set	Sh
MPLUS_TERM=gnome-terminal	gnome-terminal
MPLUS_TERM=xfce4-terminal	xfce4-terminal
MPLUS_TERM=konsole	Konsole
MPLUS_TERM=xterm	Xterm

MPLUS\_TERM=something else

(required) MPLUS\_TERM\_X variable  
(optional) MPLUS\_TERM\_T variable

## Mplus Plot Capabilities

Mplus for Mac OS X and Linux operating systems does not come with the plot capabilities provided as part of the Mplus Editor for the Windows version of Mplus. Instead, the GH5 file produced by the PLOT command can be read and plots made by the R program using the HDF5 package. For more information, please visit the Mplus-R page on the Mplus website at [www.statmodel.com/mplus-R/](http://www.statmodel.com/mplus-R/).

## Setting Environment Variables

The command and syntax for setting Linux environment variables will be given for the two most popular shells which are bash shell and C shell. For other shells, please consult the man pages for that shell by typing 'man shellname'.

For bash shell:

- export MPLUS\_TERM=xterm

For C shell:

- set MPLUS\_TERM=xterm

The commands given above can be entered into **.bashrc** for bash shell or **.cshrc** for C shell. After they are added to the **.bashrc** or **.cshrc**, the settings will automatically apply every time a new shell is opened and need not be set manually.

## Additional Documentation

The Documentation directory contains the Mplus User's Guide for Version 6 in PDF format along with the Version 6.1 Language Addendum. For Mplus updates, please check the Support page on the Mplus website at [www.statmodel.com](http://www.statmodel.com). Updates to the R functions are available on the Mplus-R page at [www.statmodel.com/mplus-R/](http://www.statmodel.com/mplus-R/).