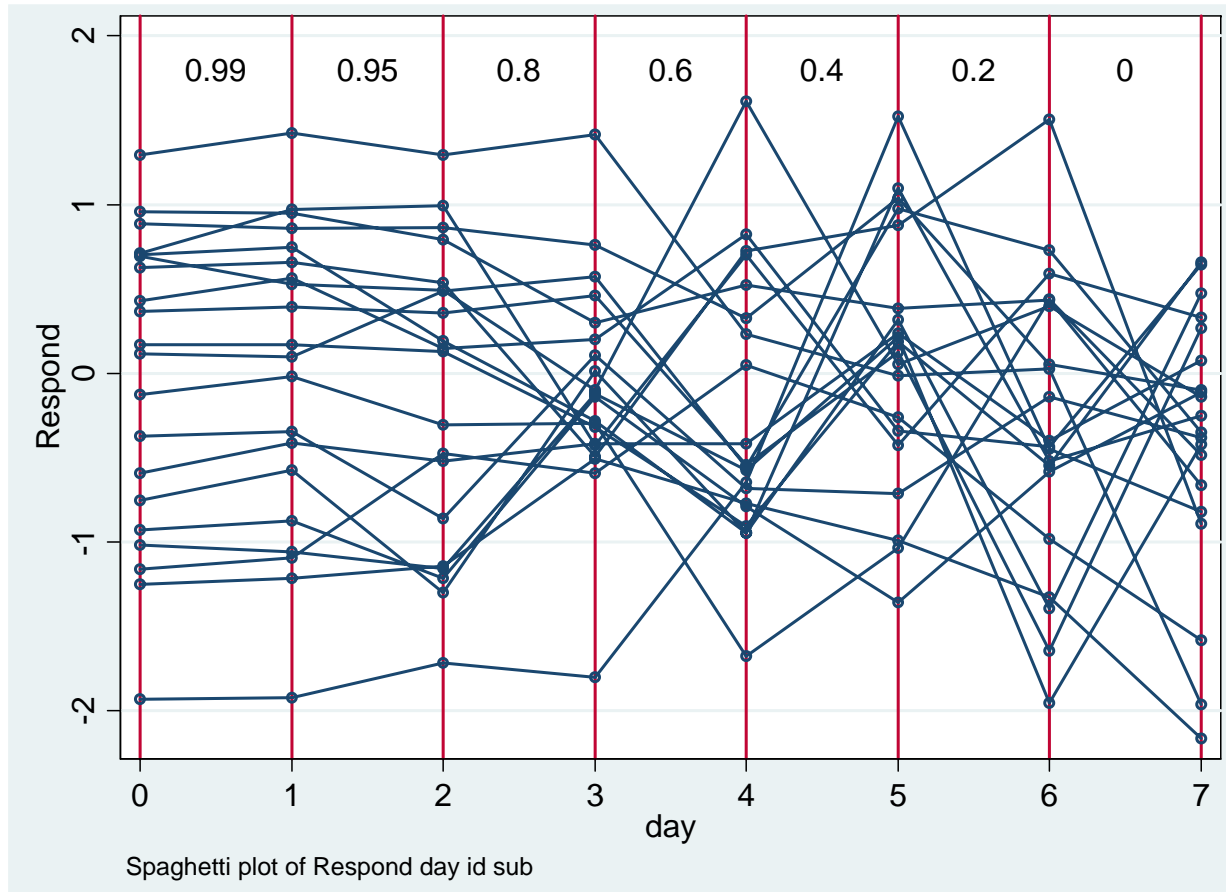


**This file illustrates how a range of correlations appear in a profile plot.**

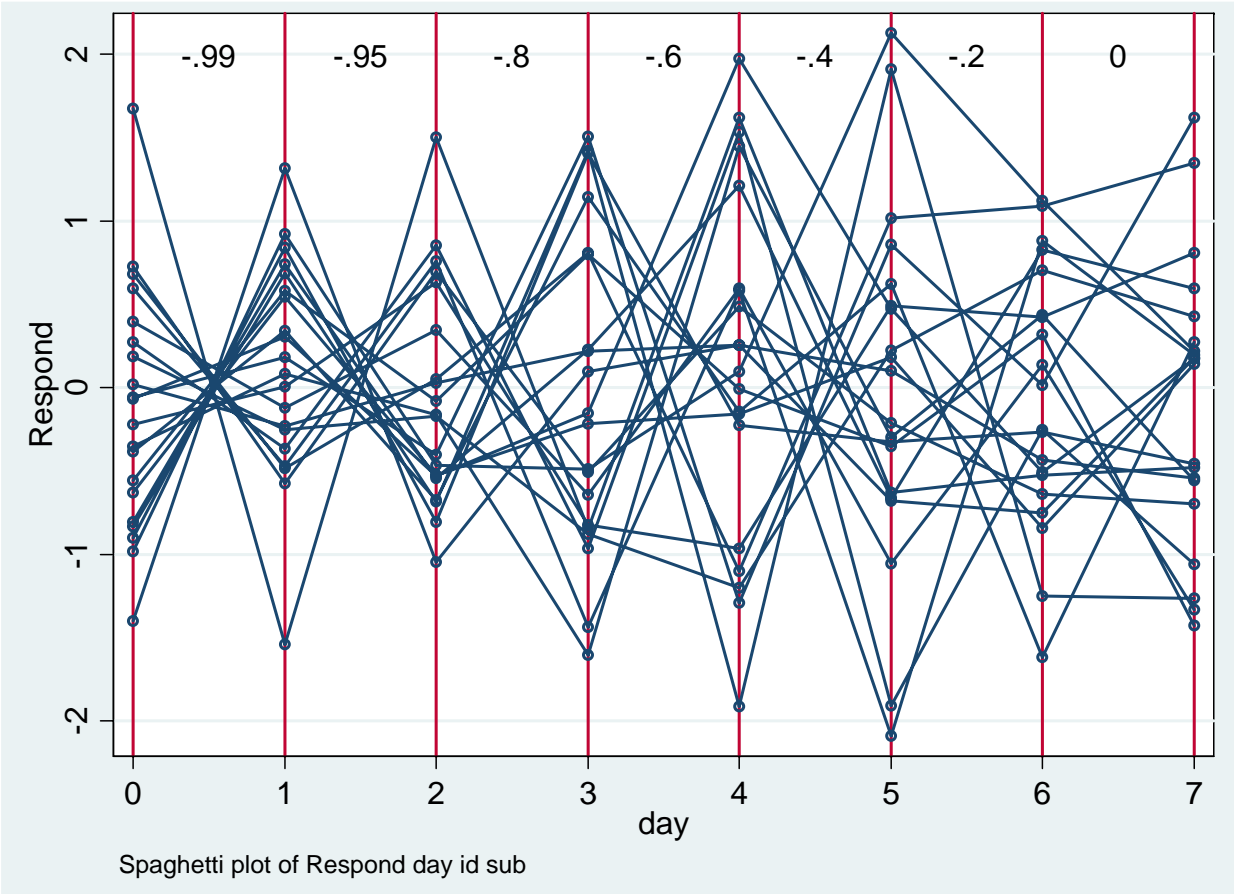
Constructed profile plot illustrating POSITIVE correlations.

There are twenty observations observed from day 0 to day 7. This graph connects points from the same observation over time. The number at the top of the graph is the correlation between two consecutive days. The graph illustrates that when the correlation between two consecutive days is high the lines do not cross each other. While the correlation is 0, we see a lot of crossing lines.



Constructed profile plot illustrating NEGATIVE correlations.

When the correlation between two consecutive days is highly negative, we observe the lines are crossing virtually at one point. The smaller the negative correlation is, the far away different lines are crossing at one point.



## STATA Code

```
clear
set more off

*Constructed profile plot illustrating various correlations.

*=====;
* positive correlation;
*=====;

set seed 123456
set obs 20
gen sub=_n
gen d0=invnormal(uniform())
local corrs "0.99 0.95 0.8 0.6 0.4 0.2 0"
local days "1 2 3 4 5 6 7"
local n: word count `corrs'
forvalues k=1/`n' {
    local corr:word `k' of `corrs'
    local day:word `k' of `days'
    gen d`day'=d0*`corr'+invnormal(uniform())*sqrt(1-`corr'^2)
}
corr d0 d1 d2 d3 d4 d5 d6 d7
*twoway scatter d0 d1
*twoway scatter d6 d7
reshape long d,i(sub) j(day)
rename d Respond
```

```

    spagplot Respond day,id(sub) nofit noover xlabel(0(1)7)
msymbol(circle_hollow) msize(small) xline(0(1)7) ///
    graphregion(lcolor(white) lwidth(vthick) margin(3 3 2 2)) ///
    plotregion(style(outline) fcolor(white) icolor(white)) ///
    text(1.8 0.5 "0.99") ///
    text(1.8 1.5 "0.95") ///
    text(1.8 2.5 "0.8") ///
    text(1.8 3.5 "0.6") ///
    text(1.8 4.5 "0.4") ///
    text(1.8 5.5 "0.2") ///
    text(1.8 6.5 "0") ///
        saving(p,replace)

```

```

graph export pcorrelation.wmf,replace

```

```

*=====;
* Negative correlation;
*=====;

```

```

clear
set seed 12345678
set obs 20
gen sub=_n
gen d0=invnormal(uniform())
local corrs "-0.99 -0.95 -0.8 -0.6 -0.4 -0.2 0"
local days "1 2 3 4 5 6 7"
local n: word count `corrs'
forvalues k=1/`n' {

```

```

    local corr:word `k' of `corrs'
    local day:word `k' of `days'
    local lagday=`day'-1
    gen d`day'=d`lagday'*`corr'+invnormal(uniform())*sqrt(1-(`corr')^2)
}
corr d0 d1 d2 d3 d4 d5 d6 d7
reshape long d,i(sub) j(day)
rename d Respond
spagplot Respond day,id(sub) nofit noover xlabel(0(1)7)
msymbol(circle_hollow) msize(small) xline(0(1)7) ///
    graphregion(lcolor(white) lwidth(vthick) margin(3 3 2 2)) ///
    plotregion(style(outline) fcolor(white) icolor(white)) ///
    text(2 0.5 "-.99") ///
    text(2 1.5 "-.95") ///
    text(2 2.5 "-.8") ///
    text(2 3.5 "-.6") ///
    text(2 4.5 "-.4") ///
    text(2 5.5 "-.2") ///
    text(2 6.5 "0") ///
    saving(n,replace)

graph export ncorrelation.wmf,replace

```