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From the SelectedWorks of Grant W. Neeley

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Appendix for ER - Policy Bundles Scaling Construction.docx

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Available at: https://works.bepress.com/grant_neeley/27/

Appendix to accompany Evaluation Review, Marijuana policy bundles in the American states over time and their impact on the use of marijuana and other drugs.

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Creating the Policy Bundle Measures

Pharmaceutical Policy Bundle

```
tetrachoric growoperational labsopen restnumbdispimp pharmdispimp nonprofitimp regmandimp renewannualdocimp
bonafidedocimp caregiverlimitimp localimp mmlexemptimp nosmokingimp if yearcode>1999, ed posdef
(obs=1,000)

matrix with tetrachoric correlations is not positive semidefinite;
  it has 5 negative eigenvalues
  maxdiff(corr,adj-corr) =  0.6664
  (adj-corr: tetrachoric correlations adjusted to be positive semidefinite)

    adj-corr | growop~l labsopen restnu~p pharmd~p nonpro~p regman~p renewa~p bonafi~p caregi.. localimp
-------------+-----------------------------------------------------------------------------------------
growoperat~l |   1.0000
    labsopen |   0.9686   1.0000
restnumbdi~p |   0.9693   0.9151   1.0000
pharmdispimp |   0.7947   0.8388   0.7871   1.0000
nonprofitimp |   0.6857   0.5644   0.7355   0.1763   1.0000
  regmandimp |   0.8806   0.8742   0.8737   0.6332   0.7709   1.0000
renewannua~p |   0.8835   0.8761   0.8566   0.7421   0.6071   0.9409   1.0000
bonafidedo~p |   0.7314   0.7713   0.6927   0.5305   0.6226   0.9150   0.8067   1.0000
caregiverl~p |   0.8441   0.8072   0.8784   0.7291   0.6860   0.9180   0.8883   0.7840   1.0000
    localimp |   0.5377   0.5396   0.4336   0.0631   0.6505   0.6400   0.4980   0.7442   0.3328   1.0000
mmlexemptimp |   0.8961   0.9135   0.7866   0.7580   0.4278   0.7697   0.8659   0.6878   0.6462   0.5916
nosmokingimp |   0.5908   0.5920   0.6291   0.8660   0.0589   0.4119   0.5871   0.1710   0.6355  -0.3336

    adj-corr | mmlexe~p nosmok~p
-------------+------------------
mmlexemptimp |   1.0000
```

```
nosmokingimp |   0.5015   1.0000

. matrix C = r(corr)

. matrix symeigen eigenvectors eigenvalues = C

. matrix list eigenvalues

eigenvalues[1,12]
            e1          e2          e3          e4          e5          e6          e7          e8
e9
r1   8.6624056   1.9863738   .70408897   .41094687   .17315145   .03478404   .02824921   5.512e-16
2.535e-16

           e10         e11         e12
r1  -1.963e-18  -9.352e-17  -2.768e-16

. factormat C, n(1000) factor(3)
(obs=1,000)
(collinear variables specified)

Factor analysis/correlation                       Number of obs    =      1,300
    Method: principal factors                     Retained factors =          3
    Rotation: (unrotated)                         Number of params =         33

    --------------------------------------------------------------------------
         Factor  |   Eigenvalue   Difference        Proportion   Cumulative
    -------------+------------------------------------------------------------
        Factor1  |      8.66241      6.67603            0.7219       0.7219
        Factor2  |      1.98637      1.28228            0.1655       0.8874
        Factor3  |      0.70409      0.29314            0.0587       0.9461
        Factor4  |      0.41095      0.23780            0.0342       0.9803
        Factor5  |      0.17315      0.13837            0.0144       0.9947
        Factor6  |      0.03478      0.00653            0.0029       0.9976
        Factor7  |      0.02825      0.02825            0.0024       1.0000
        Factor8  |      0.00000      0.00000            0.0000       1.0000
```

```
     Factor9  |      0.00000      0.00000            0.0000       1.0000
    Factor10  |      0.00000      0.00000            0.0000       1.0000
    Factor11  |      0.00000      0.00000            0.0000       1.0000
    Factor12  |     -0.00000            .           -0.0000       1.0000
--------------------------------------------------------------------------
LR test: independent vs. saturated:  chi2(66) =       . Prob>chi2 =      .
```

Factor loadings (pattern matrix) and unique variances

Variable	Factor1	Factor2	Factor3	Uniqueness
growoperat~l	0.9730	-0.0416	-0.0280	0.0508
labsopen	0.9618	-0.0736	-0.1738	0.0393
restnumbdi~p	0.9511	-0.0889	0.1613	0.0615
pharmdispimp	0.7927	-0.5531	-0.1766	0.0345
nonprofitimp	0.6904	0.4917	0.4780	0.0530
regmandimp	0.9577	0.1888	0.1111	0.0349
renewannua~p	0.9518	-0.0341	-0.0155	0.0928
bonafidedo~p	0.8408	0.3516	-0.0868	0.1618
caregiverl~p	0.9121	-0.0986	0.3206	0.0556
localimp	0.5611	0.7757	-0.2799	0.0052
mmlexemptimp	0.8801	-0.0355	-0.4169	0.0503
nosmokingimp	0.5743	-0.8065	0.1109	0.0074

Permissive Policy Bundle

```
tetrachoric reccannapproved supplygrayimp cooperatives cultimp highusableimp highplantsimp
caregivernolimitimp allformslegalimp highrecozimp reccultimp highrecplantimp possessnojailnofelonimp if
yearcode>1999, ed posdef
(obs=1,000)

matrix with tetrachoric correlations is not positive semidefinite;
  it has 5 negative eigenvalues
  maxdiff(corr,adj-corr) =  0.6688
  (adj-corr: tetrachoric correlations adjusted to be positive semidefinite)

    adj-corr | reccan~d supply~p cooper~s  cultimp highus~p highpl~p caregi.. allfor~p hig~zimp reccu~mp
-------------+--------------------------------------------------------------------------------------
reccannapp~d |   1.0000
supplygray~p |  -0.1648   1.0000
cooperatives |   0.7164  -0.3312   1.0000
     cultimp |   0.7403   0.3884   0.6161   1.0000
highusable~p |   0.7740   0.1265   0.6896   0.8266   1.0000
highplants~p |   0.2010   0.4091   0.2937   0.4210   0.3903   1.0000
caregivern~p |   0.4943   0.1880   0.3886   0.6238   0.5764  -0.3470   1.0000
allformsle~p |   0.8007   0.3752   0.5828   0.9562   0.8664   0.3815   0.6677   1.0000
highrecozimp |   0.7414  -0.4513   0.6277   0.5167   0.5481  -0.3837   0.6903   0.5146   1.0000
  reccultimp |   0.7694  -0.2335   0.5236   0.5564   0.4975  -0.4089   0.8109   0.6039   0.9208   1.0000
highrecpla~p |   0.7458  -0.3762   0.3650   0.3647   0.5153  -0.4544   0.6588   0.4807   0.8732   0.8942
possessnoj~p |   0.7991   0.0599   0.4674   0.6000   0.5478  -0.0488   0.6584   0.6562   0.5993   0.8008

    adj-corr | hig~timp posses~p
-------------+------------------
highrecpla~p |   1.0000
possessnoj~p |   0.6895   1.0000

. matrix C = r(corr)

. matrix symeigen eigenvectors eigenvalues = C

. matrix list eigenvalues
```

```
eigenvalues[1,12]
            e1          e2          e3          e4          e5          e6          e7          e8
e9
r1   6.9018178   2.6421724    1.339771   .52055443   .33926325   .20075265   .05566857   5.213e-16
1.806e-16

           e10         e11         e12
r1  -1.307e-16  -2.203e-16  -6.775e-16

. factormat C, n(1000) factor(3)
(obs=1,000)
(collinear variables specified)

Factor analysis/correlation                       Number of obs    =      1,300
    Method: principal factors                     Retained factors =          3
    Rotation: (unrotated)                         Number of params =         33

    ------------------------------------------------------------------------------
         Factor  |   Eigenvalue   Difference        Proportion   Cumulative
    -------------+----------------------------------------------------------------
        Factor1  |      6.90182      4.25965            0.5752       0.5752
        Factor2  |      2.64217      1.30240            0.2202       0.7953
        Factor3  |      1.33977      0.81922            0.1116       0.9070
        Factor4  |      0.52055      0.18129            0.0434       0.9504
        Factor5  |      0.33926      0.13851            0.0283       0.9786
        Factor6  |      0.20075      0.14508            0.0167       0.9954
        Factor7  |      0.05567      0.05567            0.0046       1.0000
        Factor8  |      0.00000      0.00000            0.0000       1.0000
        Factor9  |      0.00000      0.00000            0.0000       1.0000
       Factor10  |      0.00000      0.00000            0.0000       1.0000
       Factor11  |     -0.00000      0.00000           -0.0000       1.0000
       Factor12  |     -0.00000            .           -0.0000       1.0000
    ------------------------------------------------------------------------------
    LR test: independent vs. saturated:  chi2(66) = 2.3e+05 Prob>chi2 = 0.0000
```

Factor loadings (pattern matrix) and unique variances

Variable	Factor1	Factor2	Factor3	Uniqueness
reccannapp~d	0.9173	0.0740	-0.2498	0.0906
supplygray~p	-0.0584	0.7295	0.6804	0.0014
cooperatives	0.7169	0.1271	-0.5621	0.1540
cultimp	0.8153	0.5141	0.0846	0.0638
highusable~p	0.8207	0.3896	-0.1411	0.1547
highplants~p	-0.0017	0.9140	-0.3824	0.0183
caregivern~p	0.7895	-0.1273	0.4903	0.1201
allformsle~p	0.8561	0.4707	0.1228	0.0305
highrecozimp	0.8525	-0.4433	-0.1148	0.0635
reccultimp	0.8941	-0.3909	0.1449	0.0269
highrecpla~p	0.8019	-0.4985	0.0577	0.1052
possessnoj~p	0.8243	-0.0352	0.1795	0.2871

Fiscal Policy Bundle

```
tetrachoric reccanndispopen dispopenlegal dispfeehigh highfeecultapporrenew nodisplimitimp otherstateimp
commdispimp mmltaxdumimp himmltaximp recwhole5imp recsales5imp rectaxdumimp if yearcode>1999, ed posdef
(obs=1,000)

matrix with tetrachoric correlations is not positive semidefinite;
  it has 5 negative eigenvalues
  maxdiff(corr,adj-corr) =  0.2908
  (adj-corr: tetrachoric correlations adjusted to be positive semidefinite)

    adj-corr | reccan~n dispop~l dispfe~h highfe~w nodis~mp others~p commd~mp mmltax~p himmlt~p re~e5imp
-------------+--------------------------------------------------------------------------------------
reccanndis~n |   1.0000
dispopenle~l |   0.8201   1.0000
 dispfeehigh |   0.6033   0.8672   1.0000
highfeecul~w |   0.4112   0.7741   0.9250   1.0000
nodisplim~mp |   0.8479   0.8520   0.4833   0.3870   1.0000
otherstate~p |   0.6952   0.8912   0.7349   0.5807   0.7733   1.0000
 commdispimp |   0.8745   0.9471   0.7951   0.7351   0.8604   0.7217   1.0000
mmltaxdumimp |   0.6065   0.9124   0.8285   0.7430   0.7084   0.8513   0.7786   1.0000
 himmltaximp |   0.1591   0.6870   0.6650   0.7366   0.4568   0.7079   0.5028   0.8214   1.0000
recwhole5imp |   0.9694   0.7863   0.5261   0.2926   0.8711   0.6849   0.8289   0.6092   0.1531   1.0000
recsales5imp |   0.9267   0.8832   0.7590   0.5898   0.7886   0.8222   0.8793   0.6504   0.3433   0.8658
rectaxdumimp |   1.0000   0.8201   0.6033   0.4112   0.8479   0.6952   0.8745   0.6065   0.1591   0.9694

    adj-corr | recsal~p rectax~p
-------------+------------------
recsales5imp |   1.0000
rectaxdumimp |   0.9267   1.0000

. matrix C = r(corr)

. matrix symeigen eigenvectors eigenvalues = C

. matrix list eigenvalues
```

```
eigenvalues[1,12]
            e1          e2          e3          e4          e5          e6          e7          e8
e9
r1   8.9273112   1.9411421   .64988453   .28563535   .16589715   .03012974   9.695e-16   2.889e-16
1.128e-16

           e10         e11         e12
r1  -1.902e-16  -2.244e-16  -8.422e-16

. factormat C, n(1000) factor(3)
(obs=1,000)
(collinear variables specified)

Factor analysis/correlation                       Number of obs    =      1,300
    Method: principal factors                     Retained factors =          3
    Rotation: (unrotated)                         Number of params =         33

    ------------------------------------------------------------------------------
         Factor  |   Eigenvalue   Difference        Proportion   Cumulative
    -------------+----------------------------------------------------------------
        Factor1  |      8.92731      6.98617            0.7439       0.7439
        Factor2  |      1.94114      1.29126            0.1618       0.9057
        Factor3  |      0.64988      0.36425            0.0542       0.9599
        Factor4  |      0.28564      0.11974            0.0238       0.9837
        Factor5  |      0.16590      0.13577            0.0138       0.9975
        Factor6  |      0.03013      0.03013            0.0025       1.0000
        Factor7  |      0.00000      0.00000            0.0000       1.0000
        Factor8  |      0.00000      0.00000            0.0000       1.0000
        Factor9  |      0.00000      0.00000            0.0000       1.0000
       Factor10  |     -0.00000      0.00000           -0.0000       1.0000
       Factor11  |     -0.00000      0.00000           -0.0000       1.0000
       Factor12  |     -0.00000            .           -0.0000       1.0000
    ------------------------------------------------------------------------------
    LR test: independent vs. saturated:  chi2(66) =       . Prob>chi2 =      .

Factor loadings (pattern matrix) and unique variances
```

Variable	Factor1	Factor2	Factor3	Uniqueness
reccanndis~n	0.8827	-0.4560	-0.0873	0.0054
dispopenle~l	0.9923	0.1151	0.0269	0.0014
dispfeehigh	0.8444	0.3778	-0.3405	0.0284
highfeecul~w	0.7205	0.5639	-0.3763	0.0213
nodisplimi~p	0.8701	-0.2544	0.3444	0.0596
otherstate~p	0.8858	0.1402	0.2866	0.1135
commdispimp	0.9551	-0.0585	-0.1321	0.0670
mmltaxdumimp	0.8747	0.3538	0.1871	0.0747
himmltaximp	0.5961	0.7353	0.3100	0.0079
recwhole5imp	0.8488	-0.4981	0.0608	0.0277
recsales5imp	0.9260	-0.2229	-0.1528	0.0695
rectaxdumimp	0.8827	-0.4560	-0.0873	0.0054