final analyses

Main analyses

put table together

```r
comp <- read.table("comp.txt",sep="\t",header=T,  dec = ",")
# comp=comp[,c("infant_group","mean_age_1_days" ,"z", "n_1","r", "Location", "lang_measure", "language_
comp$type="comp"

# prod <- read.table("prod.txt",sep="\t",header=T)
# prod=prod[,c("infant_group"  ,  "mean_age_1_days" ,"r"    ,  "n_1", "Location")]
# prod$type="prod"
all=comp
#all=rbind(comp,prod)
names(all)<-c("id","age","z","n","r", "loc", "lang_measure", "lang_cat", "SES_measure", "SES_cat", "SES_

all$locgen=ifelse(all$loc=="United States","US","other")

all$z=1/2*(log((1+all$r)/(1-all$r)))
all$age.c <- all$age-mean(all$age,na.rm=T)
all$se=sqrt(1/(all$n - 3))
all$v=1/all$se
all[!is.na(all$r),]->all
write.table(all,"final.txt",row.names=F,sep="\t",quote=T)
```
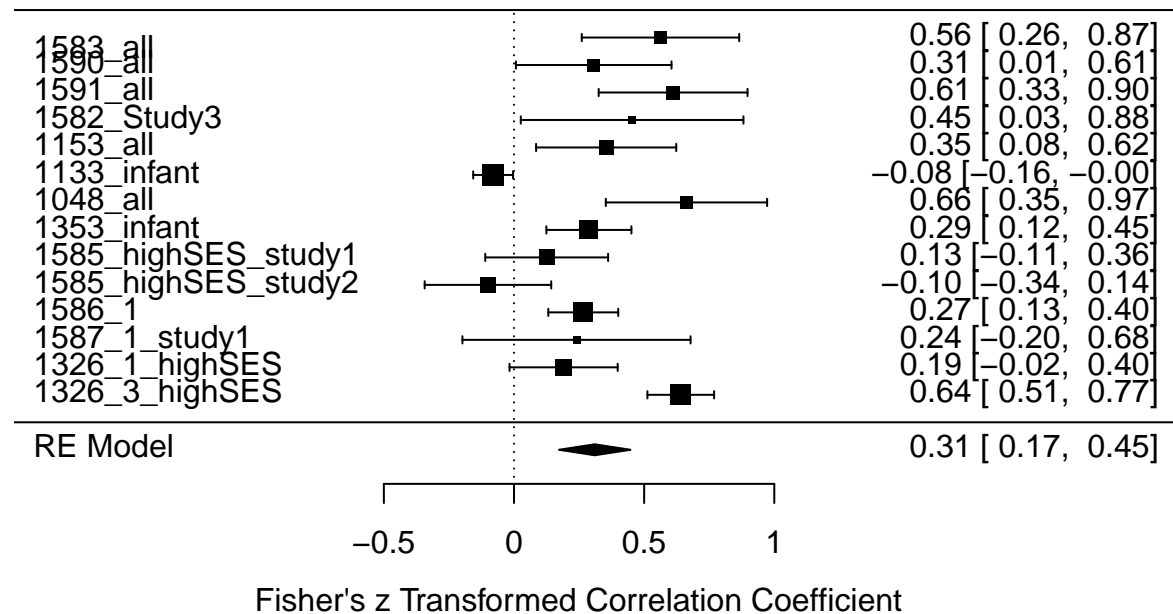
Main analyses

```r
read.table("final.txt",header=T)->all

rma.all=rma(ri=all$r,ni=all$n,measure="ZCOR",slab=all$id)
rma.all
```

```
##
## Random-Effects Model (k = 14; tau^2 estimator: REML)
##
## tau^2 (estimated amount of total heterogeneity): 0.0520 (SE = 0.0266)
## tau (square root of estimated tau^2 value):      0.2279
## I^2 (total heterogeneity / total variability):   84.86%
## H^2 (total variability / sampling variability):  6.60
##
## Test for Heterogeneity:
## Q(df = 13) = 130.3347, p-val < .0001
##
## Model Results:
##
## estimate      se    zval    pval   ci.lb   ci.ub
##   0.3102  0.0700  4.4296  <.0001  0.1729  0.4474  ***
##
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

forest(rma.all)


```
1583_all                        0.56 [ 0.26,  0.87]
1590_all                        0.31 [ 0.01,  0.61]
1591_all                        0.61 [ 0.33,  0.90]
1582_Study3                     0.45 [ 0.03,  0.88]
1153_all                        0.35 [ 0.08,  0.62]
1133_infant                    -0.08 [-0.16, -0.00]
1048_all                        0.66 [ 0.35,  0.97]
1353_infant                     0.29 [ 0.12,  0.45]
1585_highSES_study1             0.13 [-0.11,  0.36]
1585_highSES_study2            -0.10 [-0.34,  0.14]
1586_1                          0.27 [ 0.13,  0.40]
1587_1_study1                   0.24 [-0.20,  0.68]
1326_1_highSES                  0.19 [-0.02,  0.40]
1326_3_highSES                  0.64 [ 0.51,  0.77]

RE Model                        0.31 [ 0.17,  0.45]

        -0.5      0      0.5      1

Fisher's z Transformed Correlation Coefficient
```

regtest(rma.all)

```
##
## Regression Test for Funnel Plot Asymmetry
##
## model:     mixed-effects meta-regression model
## predictor: standard error
##
## test for funnel plot asymmetry: z = 1.1386, p = 0.2549
```

pdf("~/Desktop/funnel.pdf",height=5,width=5)
funnel(rma.all)
points(all$se~all$z,pch=20,col="white")
 # points(all$se~all$z,subset=c(all$type=="prod"),pch=20,col="red")
 # points(all$se~all$z,subset=c(all$id=="notre_CCT"),pch=3,cex=2)
 # points(all$se~all$z,subset=c(all$id=="notre_CDI_production"),pch=3,cex=2)

all moderators

rma.typeAge=**rma**(ri=all$r,ni=all$n,measure="ZCOR",slab=all$id, mods=~all$age.c)
rma.typeAge

```
##
## Mixed-Effects Model (k = 14; tau^2 estimator: REML)
##
## tau^2 (estimated amount of residual heterogeneity):    0.0189 (SE = 0.0133)
## tau (square root of estimated tau^2 value):            0.1373
## I^2 (residual heterogeneity / unaccounted variability): 62.67%
## H^2 (unaccounted variability / sampling variability):   2.68
## R^2 (amount of heterogeneity accounted for):            63.69%
```

```
## 
## Test for Residual Heterogeneity:
## QE(df = 12) = 35.0234, p-val = 0.0005
## 
## Test of Moderators (coefficient(s) 2):
## QM(df = 1) = 14.2951, p-val = 0.0002
## 
## Model Results:
## 
##             estimate      se    zval    pval   ci.lb   ci.ub
## intrcpt       0.2291  0.0522  4.3915  <.0001  0.1269  0.3314  ***
## all$age.c     0.0005  0.0001  3.7809  0.0002  0.0002  0.0008  ***
## 
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

location

```
rma.loc=rma(ri=all$r,ni=all$n,measure="ZCOR",slab=all$id,mods=~all$locgen)
rma.loc
```

```
## 
## Mixed-Effects Model (k = 14; tau^2 estimator: REML)
## 
## tau^2 (estimated amount of residual heterogeneity):     0.0497 (SE = 0.0267)
## tau (square root of estimated tau^2 value):             0.2229
## I^2 (residual heterogeneity / unaccounted variability): 84.61%
## H^2 (unaccounted variability / sampling variability):   6.50
## R^2 (amount of heterogeneity accounted for):            4.38%
## 
## Test for Residual Heterogeneity:
## QE(df = 12) = 128.2664, p-val < .0001
## 
## Test of Moderators (coefficient(s) 2):
## QM(df = 1) = 1.6067, p-val = 0.2050
## 
## Model Results:
## 
##                estimate      se    zval    pval    ci.lb   ci.ub
## intrcpt          0.0914  0.1854  0.4931  0.6219  -0.2720  0.4549
## all$locgenUS     0.2531  0.1997  1.2676  0.2050  -0.1383  0.6445
## 
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

language cat

```
rma.lang_cat=rma(ri=all$r,ni=all$n,measure="ZCOR",slab=all$id,mods=~all$lang_cat)
rma.lang_cat
```

```
## 
## Mixed-Effects Model (k = 14; tau^2 estimator: REML)
```

```
##
## tau^2 (estimated amount of residual heterogeneity):     0.0305 (SE = 0.0195)
## tau (square root of estimated tau^2 value):              0.1746
## I^2 (residual heterogeneity / unaccounted variability): 71.93%
## H^2 (unaccounted variability / sampling variability):    3.56
## R^2 (amount of heterogeneity accounted for):            41.34%
##
## Test for Residual Heterogeneity:
## QE(df = 11) = 43.3806, p-val < .0001
##
## Test of Moderators (coefficient(s) 2:3):
## QM(df = 2) = 8.3097, p-val = 0.0157
##
## Model Results:
##
##                     estimate      se     zval    pval    ci.lb   ci.ub
## intrcpt               0.0138  0.1507   0.0916  0.9270  -0.2815  0.3091
## all$lang_catCDI       0.1459  0.1898   0.7685  0.4422  -0.2261  0.5179
## all$lang_catPPVT      0.4187  0.1678   2.4957  0.0126   0.0899  0.7475   *
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

SES cat

```
rma.SES_cat=rma(ri=all$r,ni=all$n,measure="ZCOR",slab=all$id,mods=~all$SES_cat)
rma.SES_cat
```

```
##
## Mixed-Effects Model (k = 14; tau^2 estimator: REML)
##
## tau^2 (estimated amount of residual heterogeneity):     0.0591 (SE = 0.0325)
## tau (square root of estimated tau^2 value):              0.2430
## I^2 (residual heterogeneity / unaccounted variability): 82.03%
## H^2 (unaccounted variability / sampling variability):    5.57
## R^2 (amount of heterogeneity accounted for):             0.00%
##
## Test for Residual Heterogeneity:
## QE(df = 11) = 65.3217, p-val < .0001
##
## Test of Moderators (coefficient(s) 2:3):
## QM(df = 2) = 0.4977, p-val = 0.7797
##
## Model Results:
##
##                               estimate      se     zval    pval    ci.lb
## intrcpt                         0.3034  0.1406   2.1584  0.0309   0.0279
## all$SES_cateducation_based     -0.0217  0.1715  -0.1264  0.8994  -0.3578
## all$SES_catincome_based         0.1239  0.2304   0.5378  0.5907  -0.3277
##                               ci.ub
## intrcpt                      0.5789   *
## all$SES_cateducation_based   0.3144
## all$SES_catincome_based      0.5755
```

```
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

SES priority

```
rma.SES_priority=rma(ri=all$r,ni=all$n,measure="ZCOR",slab=all$id,mods=~all$SES_priority)
rma.SES_priority
```

```
##
## Mixed-Effects Model (k = 14; tau^2 estimator: REML)
##
## tau^2 (estimated amount of residual heterogeneity):     0.0531 (SE = 0.0283)
## tau (square root of estimated tau^2 value):             0.2304
## I^2 (residual heterogeneity / unaccounted variability): 83.86%
## H^2 (unaccounted variability / sampling variability):   6.19
## R^2 (amount of heterogeneity accounted for):            0.00%
##
## Test for Residual Heterogeneity:
## QE(df = 12) = 129.2942, p-val < .0001
##
## Test of Moderators (coefficient(s) 2):
## QM(df = 1) = 0.9195, p-val = 0.3376
##
## Model Results:
##
##                     estimate      se     zval    pval    ci.lb   ci.ub
## intrcpt               0.3635  0.0897   4.0505  <.0001   0.1876  0.5394
## all$SES_priorityyes  -0.1394  0.1454  -0.9589  0.3376  -0.4245  0.1456
##
## intrcpt              ***
## all$SES_priorityyes
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

type of measure

```
rma.type_of_measure=rma(ri=all$r,ni=all$n,measure="ZCOR",slab=all$id,mods=~all$type_of_measure)
rma.type_of_measure
```

```
##
## Mixed-Effects Model (k = 14; tau^2 estimator: REML)
##
## tau^2 (estimated amount of residual heterogeneity):     0.0481 (SE = 0.0261)
## tau (square root of estimated tau^2 value):             0.2194
## I^2 (residual heterogeneity / unaccounted variability): 80.11%
## H^2 (unaccounted variability / sampling variability):   5.03
## R^2 (amount of heterogeneity accounted for):            7.32%
##
## Test for Residual Heterogeneity:
## QE(df = 12) = 62.3639, p-val < .0001
```

```
## 
## Test of Moderators (coefficient(s) 2):
## QM(df = 1) = 1.2271, p-val = 0.2680
## 
## Model Results:
## 
##                                estimate       se      zval     pval     ci.lb
## intrcpt                          0.3532   0.0787    4.4902   <.0001    0.1990
## all$type_of_measureindirect     -0.1732   0.1564   -1.1077   0.2680   -0.4797
##                                  ci.ub
## intrcpt                         0.5074   ***
## all$type_of_measureindirect     0.1333
## 
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

age

```
pdf("~/Desktop/age.pdf")
plot(all$z~ all$age,cex=1+(all$n/max(all$n,na.rm=T)),col=ifelse(all$type=="comp","red","black"),xlab="Ag
lines(c(0,1500),c(0,0),lty=2)
dev.off()
```

```
## pdf
##   2
```