effect

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파일 불러오기

```
effect <- read.csv("C:\\Users\\phl02\\Desktop\\P\\bio_sas\\data\\con12.csv")
head(effect)
```

```
##    study n1   m1   s1 n2   m2   s2 g
## 1 study1  7 23.3 4.30  6 39.0 7.40 0
## 2 study2 11 27.2 1.00 11 35.9 1.50 0
## 3 study3  9 28.9 2.10 10 33.4 1.30 0
## 4 study4 12 27.8 2.00  9 36.1 2.80 0
## 5 study5 10 43.2 5.73  5 61.8 9.37 0
## 6 study6  9 53.1 7.89  6 55.8 9.43 0
```

분석 진행

meta분석을 진행하는 패키지 중 하나가 'meta' 'metacont'명령어를 사용하여 분석을 진행

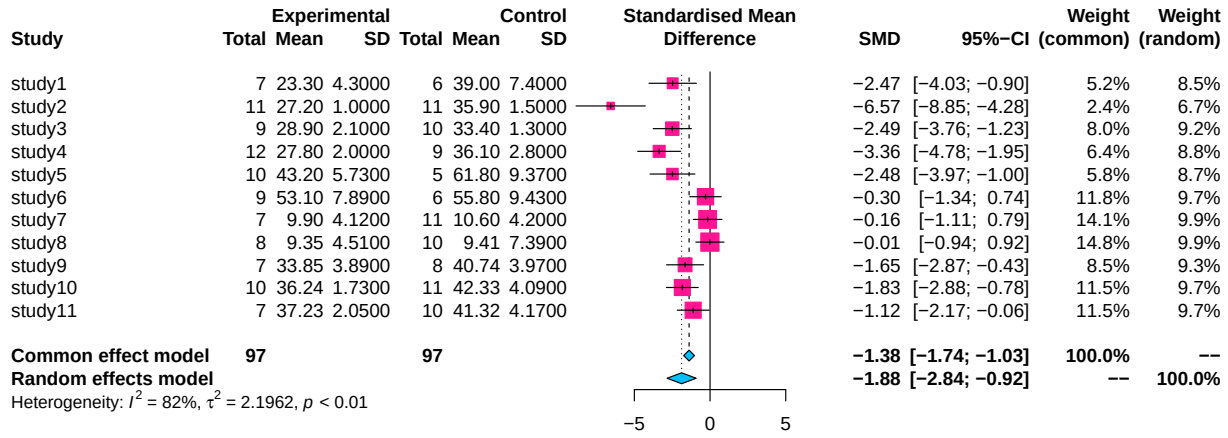
```
library(meta)
meta <- metacont(n1,m1,s1,n2,m2,s2,data=effect,sm='SMD',method.smd ='Hedges',study)
meta
```

```
## Number of studies: k = 11
## Number of observations: o = 194
##
##                          SMD             95%-CI     z  p-value
## Common effect model  -1.3840 [-1.7411; -1.0269] -7.60 < 0.0001
## Random effects model -1.8765 [-2.8368; -0.9161] -3.83   0.0001
##
## Quantifying heterogeneity:
##  tau^2 = 2.1962 [0.8823; 9.7330]; tau = 1.4820 [0.9393; 3.1198]
##  I^2 = 81.6% [68.1%; 89.3%]; H = 2.33 [1.77; 3.06]
##
## Test of heterogeneity:
##      Q d.f.  p-value
##  54.21   10 < 0.0001
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-Profile method for confidence interval of tau^2 and tau
## - Hedges' g (bias corrected standardised mean difference; using exact formulae)
```

효과크기 확인

기본은 흑백이지만 가독성을 위해 색을 추가함

```
forest(meta,col.diamond = 'deepskyblue1',col.square = 'deeppink1')
```



다이아몬드는 전체 연구를 종합한 평균효과크기
사각형은 개별 연구의 평균 효과크기

SMD값을 교정된 표준화된 평균 차이로 환산

```
meta_result <- c(meta$TE.fixed,meta$upper.fixed,meta$lower.fixed,
                 meta$TE.random,meta$upper.random,meta$lower.random)
Hedges <- round((1-2*pnorm(meta_result,0,1)),2)
Hedges
```

```
## [1] 0.83 0.70 0.92 0.94 0.64 1.00
```

결과 정리

```
library(kableExtra)
result <- matrix(0,2,8)
colnames(result) <- c('k','SMD','effect size','95% CI_low',
                      '95% CI_up','p','Q(df)',expression(I^2))
row.names(result) <- c('Fixed','random')
result[,1] <- meta$n.e.pooled
result[1,2] <- round(meta$TE.fixed,2)
result[2,2] <- round(meta$TE.random,2)
result[1,3:5] <- Hedges[1:3]
result[2,3:5] <- Hedges[4:6]
result[1,6] <- meta$pval.fixed
result[2,6] <- meta$pval.random
for (i in 1:2){
  if (result[i,6] <0.001){result[i,6] <- '<.001'}
}
result[,7] <- paste(round(meta$Q,2),'(', meta$df.Q,')')
result[,8] <- round(meta$I2*100,2)
kable(result,format = 'latex')
```

	k	SMD	effect size	95% CI_low	95% CI_up	p	Q(df)	I^2
Fixed	97	-1.38	0.83	0.7	0.92	<.001	54.21 (10)	81.55
random	97	-1.88	0.94	0.64	1	<.001	54.21 (10)	81.55