

**WHEREVER THERE IS SIN...**



**THAT'S WHERE I MUST GO**

## Replicability in science – not just psychology

Problems replicating some findings

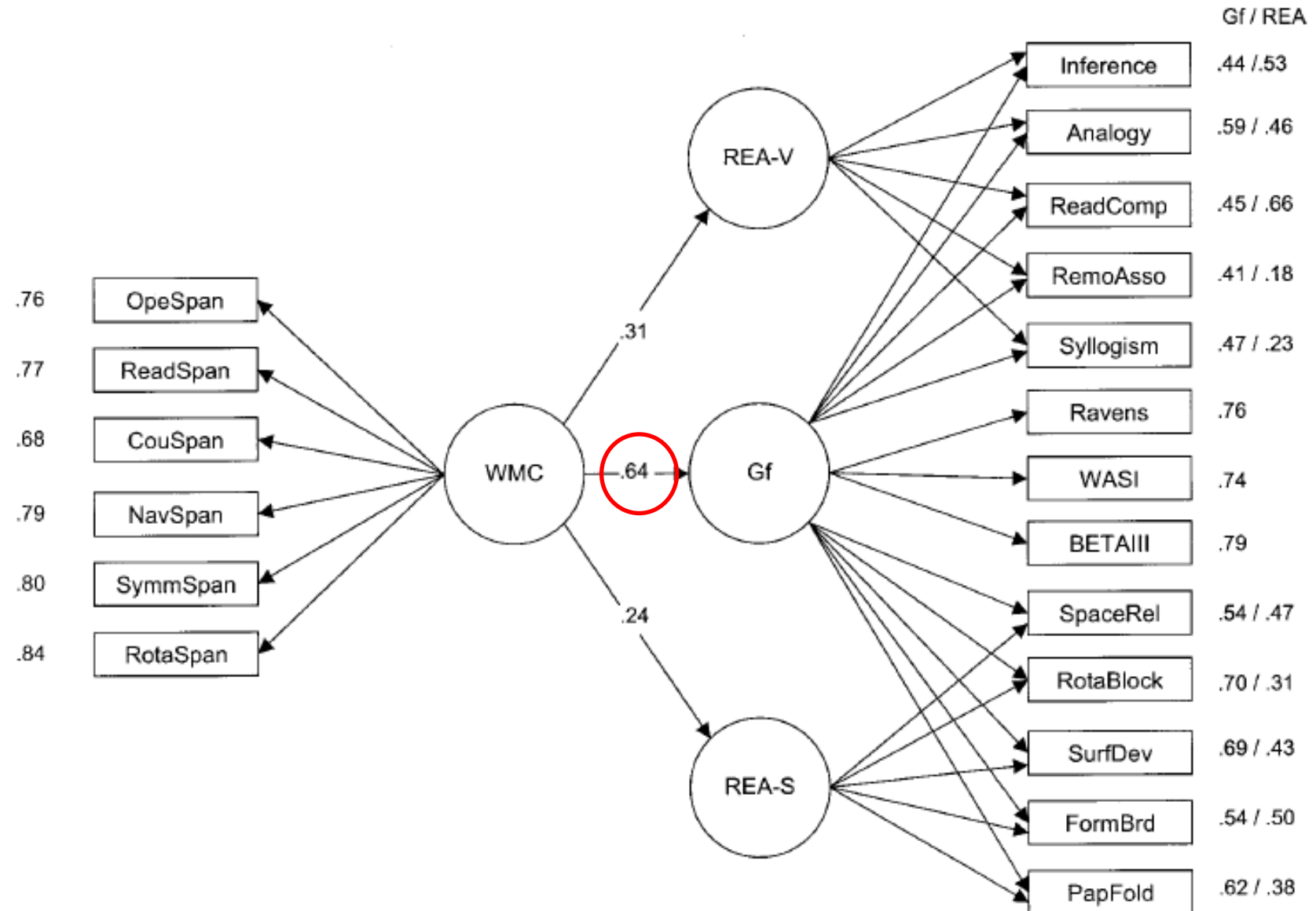
Paper in press in *Science* – 68 labs attempted to replicate over 90 findings in cognitive and social psychology

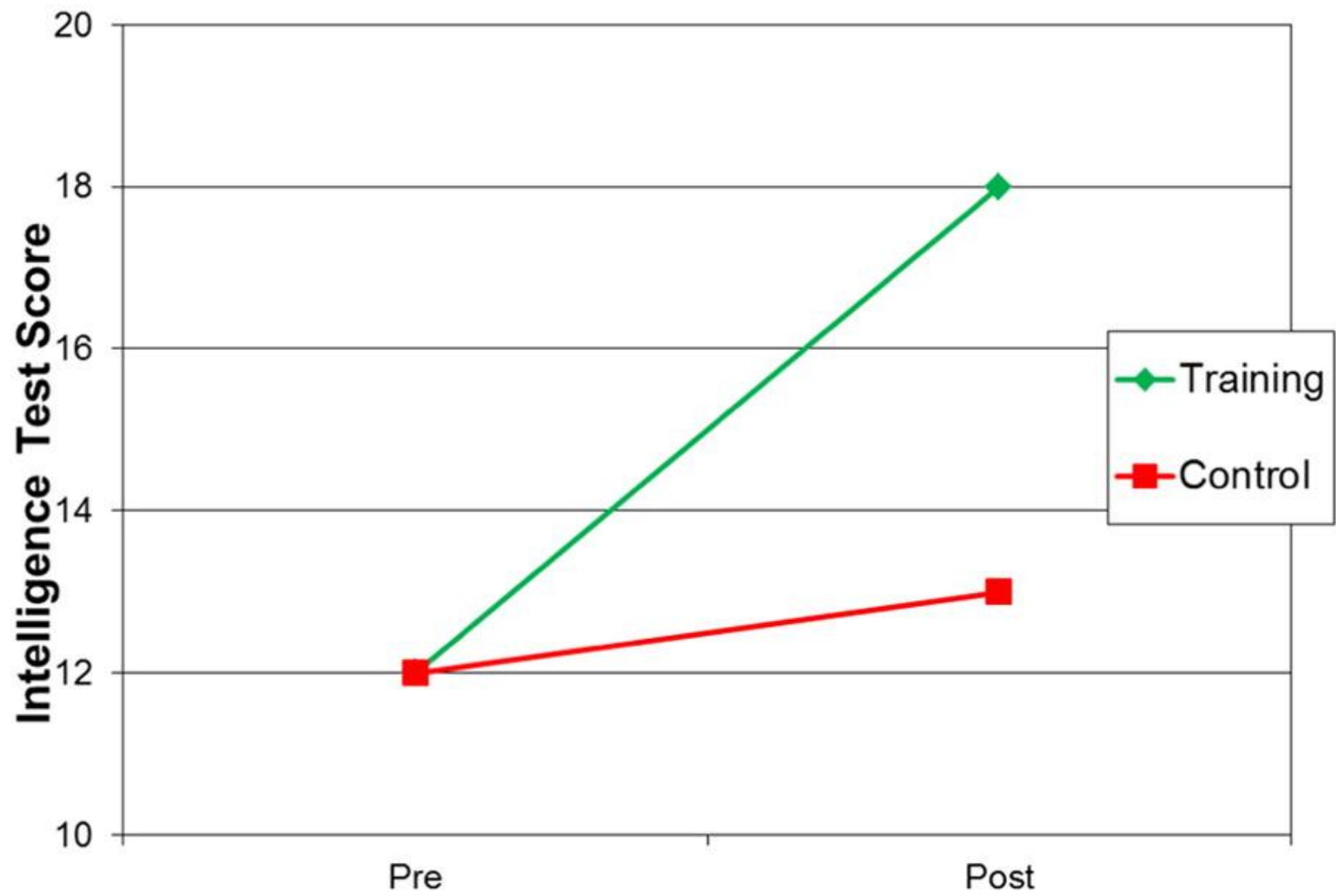
About 40% of cognitive and 30% social papers replicated – I remain optimistic

Problems are often small n, low reliability of the measures, regression to the mean, faulty interpretation of statistics, and co-morbid variables among the **subjects** other than the one of interest. Assumption that High/Low WM, High/Low Video users, Bilingual/Monolingual subjects are identical in every other way is a huge one.

WM training, Video games, Bilingualism

## Relationship between WMC and Gf





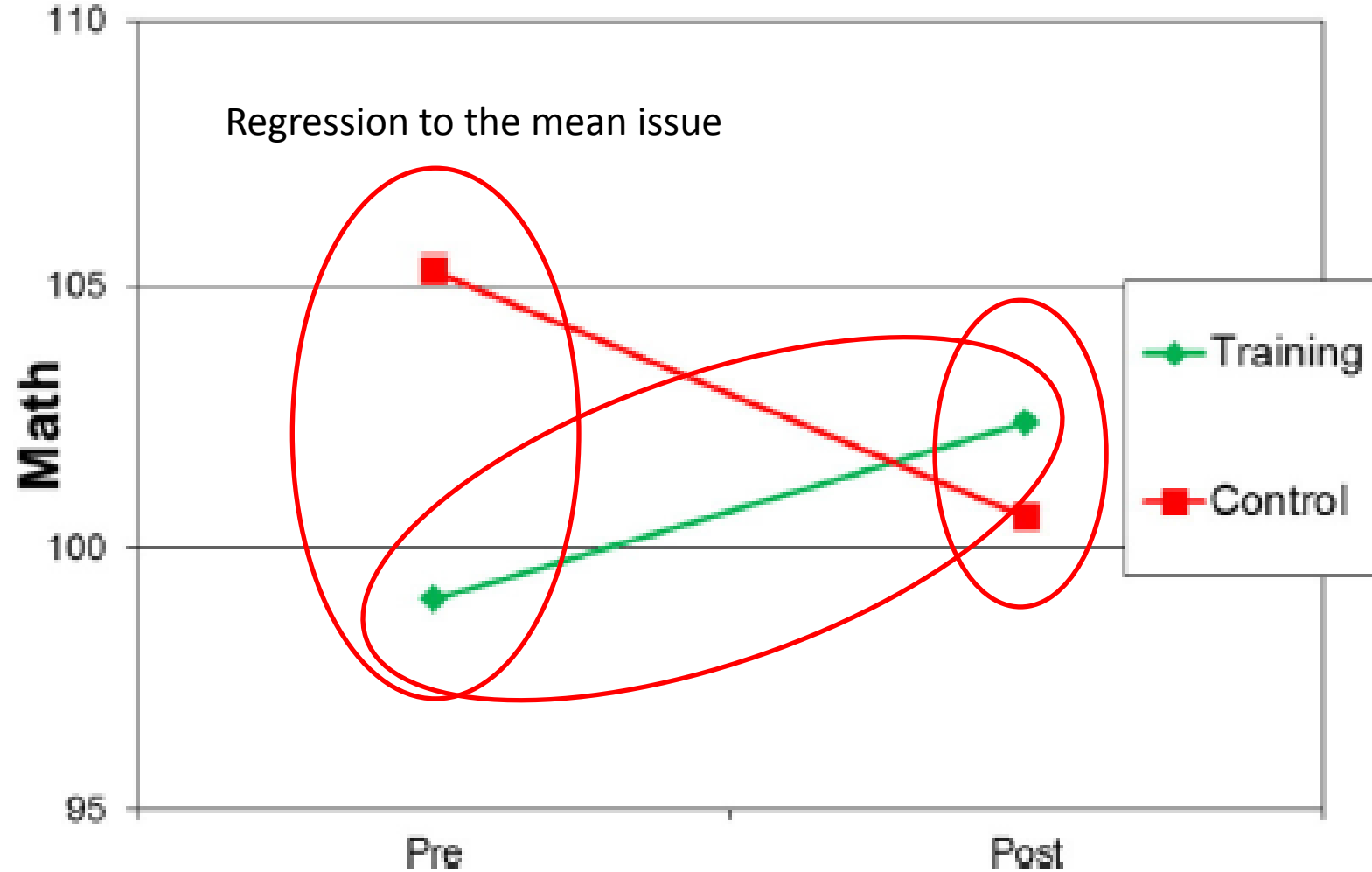
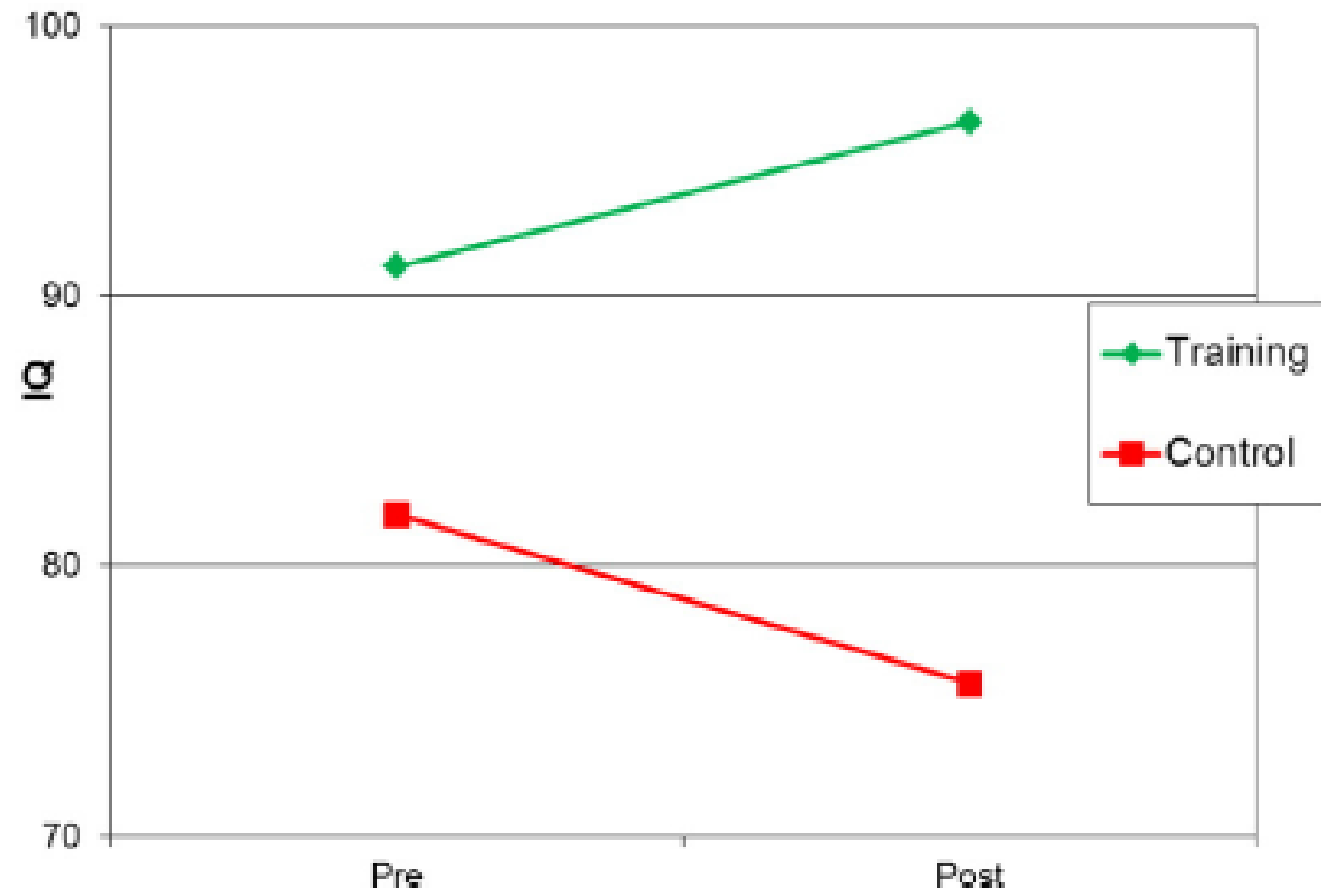


Fig. 2. Alloway (2012) transfer data on Numerical Operations test from the Wechsler Objective Numerical Dimensions as a function of group.



**Fig. 3.** Roughan and Hadwin (2011) transfer data on IQ composite as a function of group.

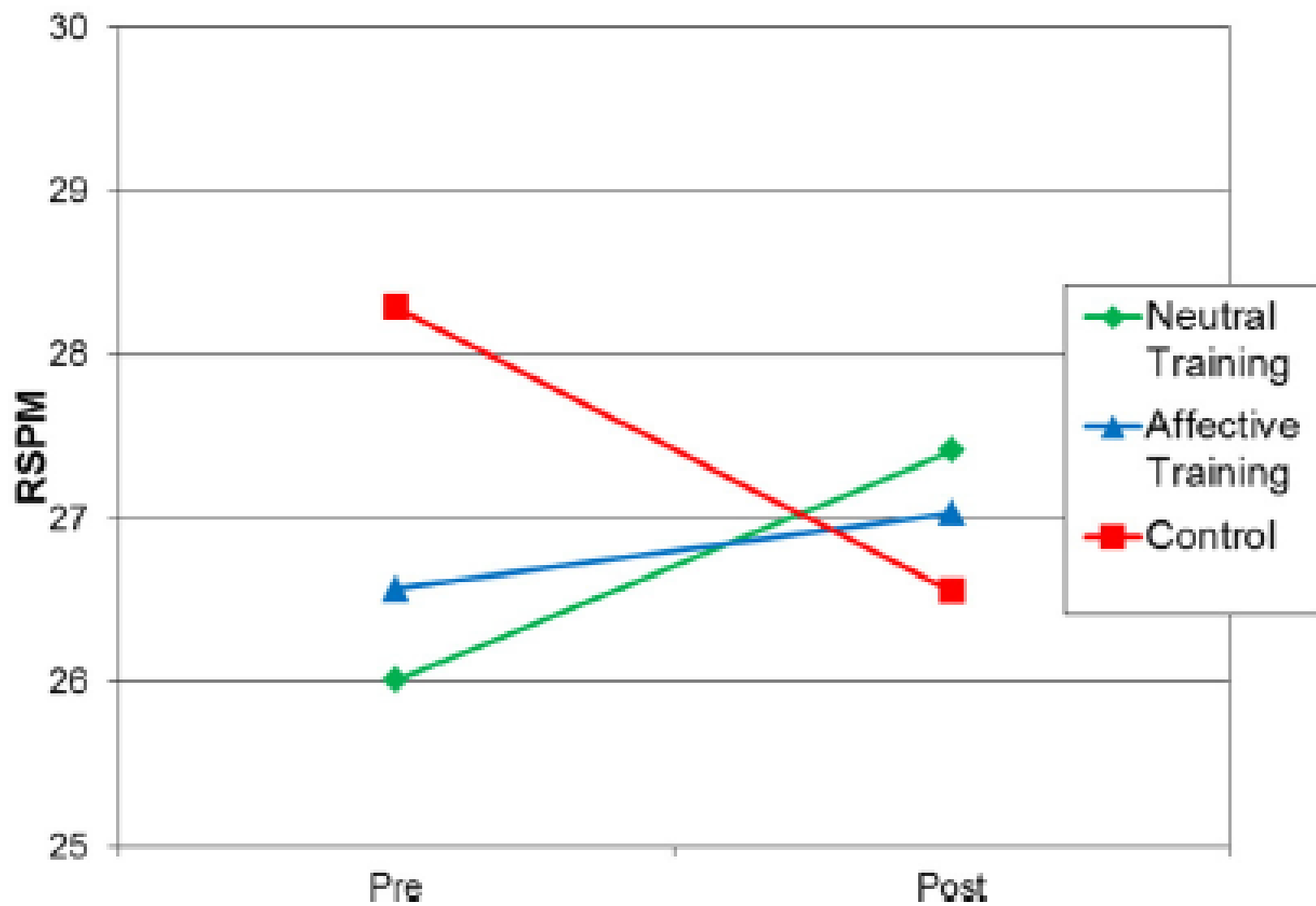


Fig. 4. Schweizer et al. (2011) transfer data on Raven Standard Progressive Matrices as a function of group.

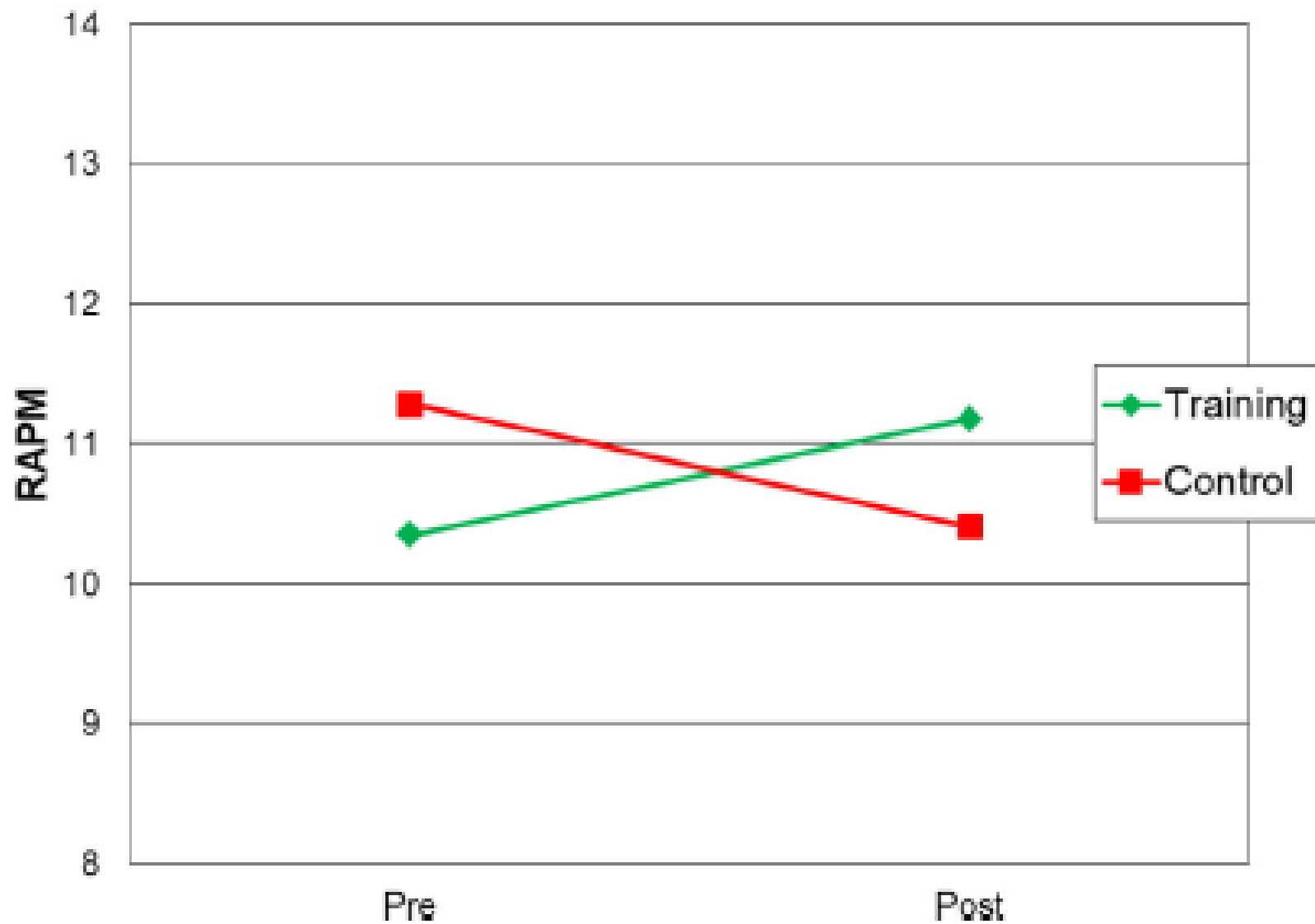
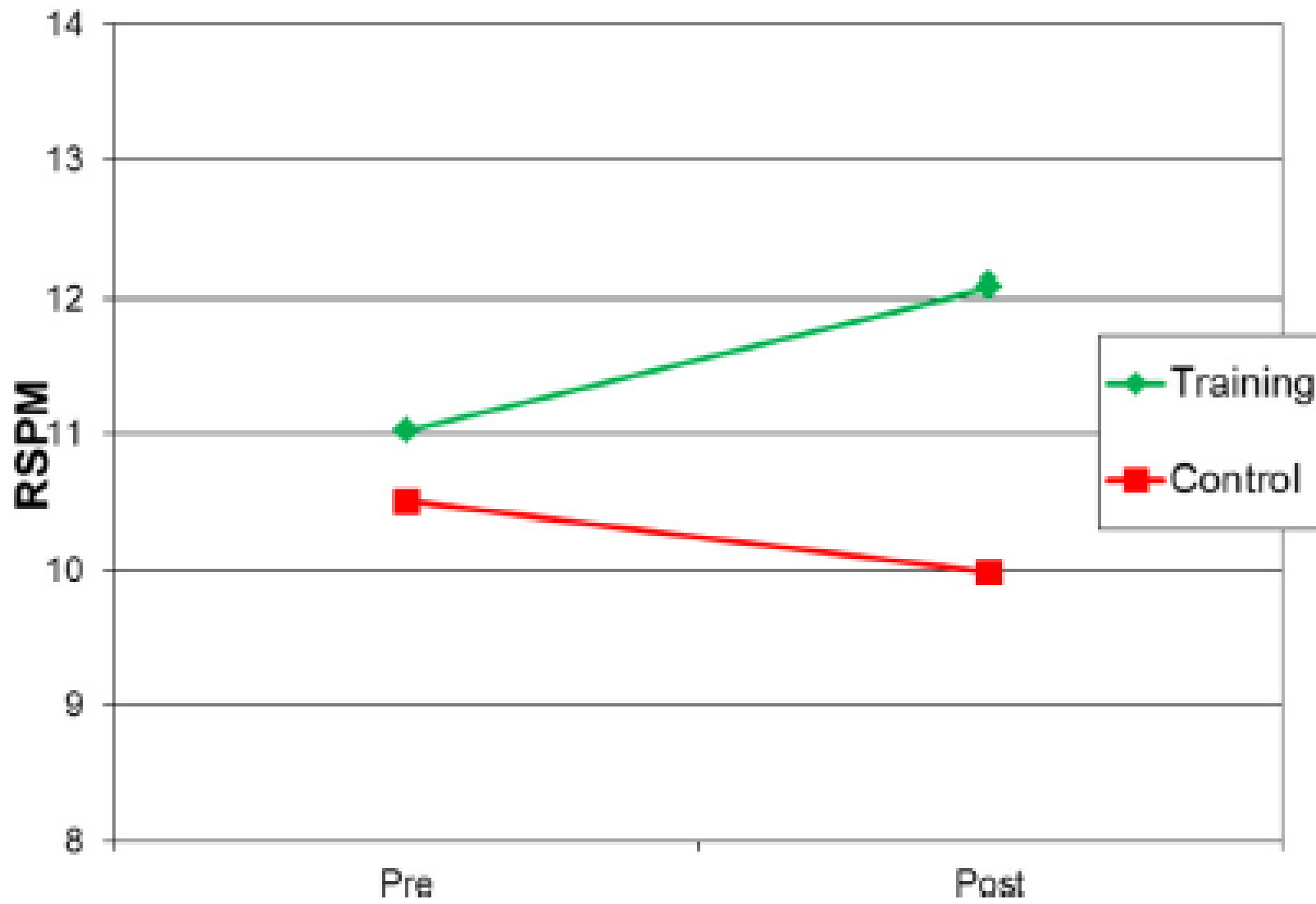


Fig. 5. Vartanian et al. (2013) transfer data on Raven Advanced Progressive Matrices as a function of group.





**Fig. 6.** Zinke et al. (2014) transfer data on Raven Standard Progressive Matrices as a function of group.

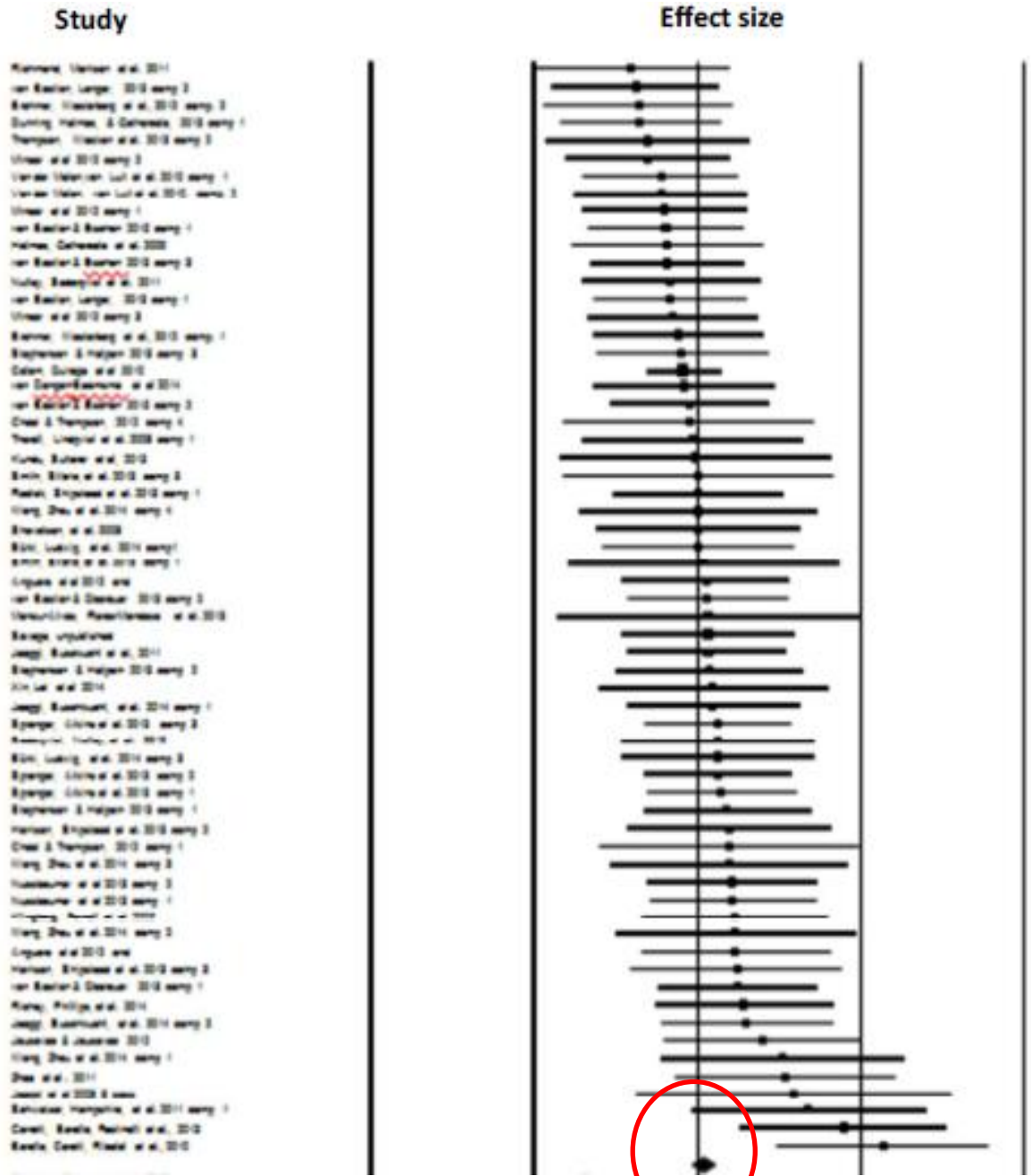
Even if there were effects, we don't know why – spatial skills??

Dissociation between mechanisms in WMC (maintenance) and Gf (Disengagement)

Meta analysis of studies – PBR and Perspectives papers

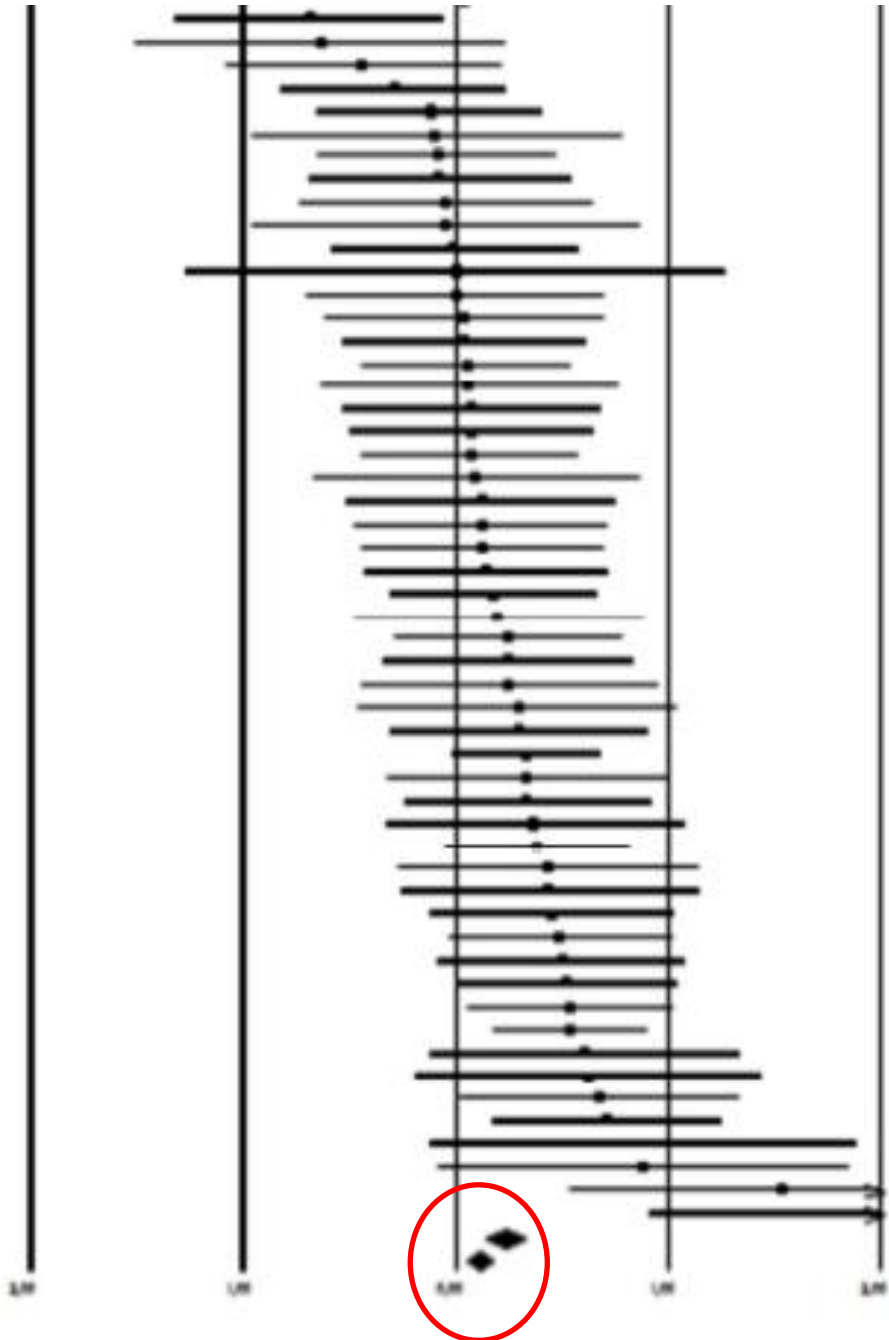
Monica Lervag-Melby, Charles Hulme, and Tom Redick

Treated  
(Active)



Untreated  
(Passive)

Kathryn, Brown, et al. 2012  
Smith, Eliza et al. 2012 serg 2  
Zina, Sarah et al. 2012  
Dunlop, James, & Catherine, 2012 serg 2  
Kathryn et al. 2011  
Hesterley, Jennifer et al. 2007  
Elli, Luky et al. 2014 serg 1  
Thompson, Heather et al. 2012 serg 1  
Catherine, Nicola et al. 2012 serg 1  
Jenny et al. 2008 2 serg  
Elli, Luky et al. 2014 serg 2  
Kurt, Bulent et al. 2012  
Catherine, Nicola et al. 2012 serg 2  
Chris & Thompson, 2012 serg 2  
Karin, Elizabeth et al. 2012 serg 2  
Ulmer et al. 2012  
Sally, Luky et al. 2008 serg 2  
Kathryn, Carol, Catherine et al. 2014 serg 2  
Kathryn 2012 serg 1  
Caren, Renee et al. 2012  
Chris & Thompson, 2012 serg 2  
Kathryn, Carol, et al. 2012  
Jenni, Elizabeth et al. 2011  
Taraun, Neil et al. 2012  
Elizabeth, Elizabeth et al. 2012 serg 1  
Daria 2011  
Anthony et al. 2012 serg 2  
Elizabeth & Helen 2012 serg 2  
Chris & Helen 2012  
Hazel et al. 2014 serg 2  
Daria, Luky et al. 2008 serg 1  
Kathryn, Carol, Catherine et al. 2014 serg 1  
Kathryn, Lorna et al. 2012 serg 1  
Theri, Ursula et al. 2008 serg 2  
Elizabeth & Helen 2012 serg 2  
Fugh, Lisa et al. 2014  
Tina, Tara et al. 2012  
Kathryn et al. 2012 serg 1  
Hazel et al. 2014 serg 1  
Elizabeth, Elizabeth et al. 2012 serg 2  
Elizabeth & Helen 2012 serg 1  
Kathryn 2012 serg 2  
Jenny, Elizabeth et al. 2012 serg 2  
Jenny, Elizabeth et al. 2012 serg 1  
Kathryn, Lorna et al. 2012 serg 2  
Hazel, 2014  
Jenni et al. 2008 2 serg  
Carol, Kath, Daria, et al. 2012  
Kathryn, Sara et al. 2012  
Jenny et al. 2008 2 serg  
Jenny et al. 2008 1 serg  
Natal, Daria et al. 2008  
Christy, Anthony et al. 2008



## Video Games

Problem with extreme groups designs – also relevant to bilingualism studies

Unsworth et al on extreme groups or full range – recent Psych Sci paper

Again, what are the mechanisms?

## Bilingualism

I have always been open to these effects for several reasons.

1. One is that we are not talking about some magical 'increase intelligence' pill but actually modifying the mental behaviors we call executive functions. It makes sense to me that people might be trained to be better at doing those things we call functions.

2. The other thing is that there is a yin and yang quality to bilingualism that is really interesting and I expect plays a large role in the findings. So while bilinguals are putatively better at inhibition, particularly as it relates to non-verbal tasks, they are worse at vocabulary and, importantly for my work, fluency.

I don't know why these effects are sometimes found and sometimes not.

