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THE EFFECT OF ANALOGICAL THINKING ON GENERATING CREATIVE PRODUCTS. A QUANTITATIVE META-ANALYSIS

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Introduction

- Associative thinking is a key component of the problem solving ability of designers ⟹ analogical reasoning has an important role in creative thinking
- it allows reflection by focusing on apparently unrelated data
- creative people take into account not only the relevant parts of the problems, but apparently the irrelevant stimuli as well

Effect	Effect
if the analogies help bringing ideas and experience in understanding the problem	the analogy is based on an incorrect solution, causing fixation in the problem solving situation

Main objectives:

- to examine the effect of analogical thinking on the process of generating creative products and
- to provide a global effect size of the effects of analogical thinking on creativity, using visual cues

Method

1. Selection of studies

- PsycINFO, Ebsco and IEEExplore
- key terms: *analogical reasoning, analogy, creativity, divergent thinking,* and *originality*
- inclusion criteria were:
  a) creativity should be measured by performance;
  b) studies should use analogical thinking quantified in clues or cases;
  c) studies must report quantitative data which allows us to calculate effect sizes;
  d) studies must be written in English

2. Coding of studies

3. Statistical analysis

- Comprehensive Meta-Analysis program

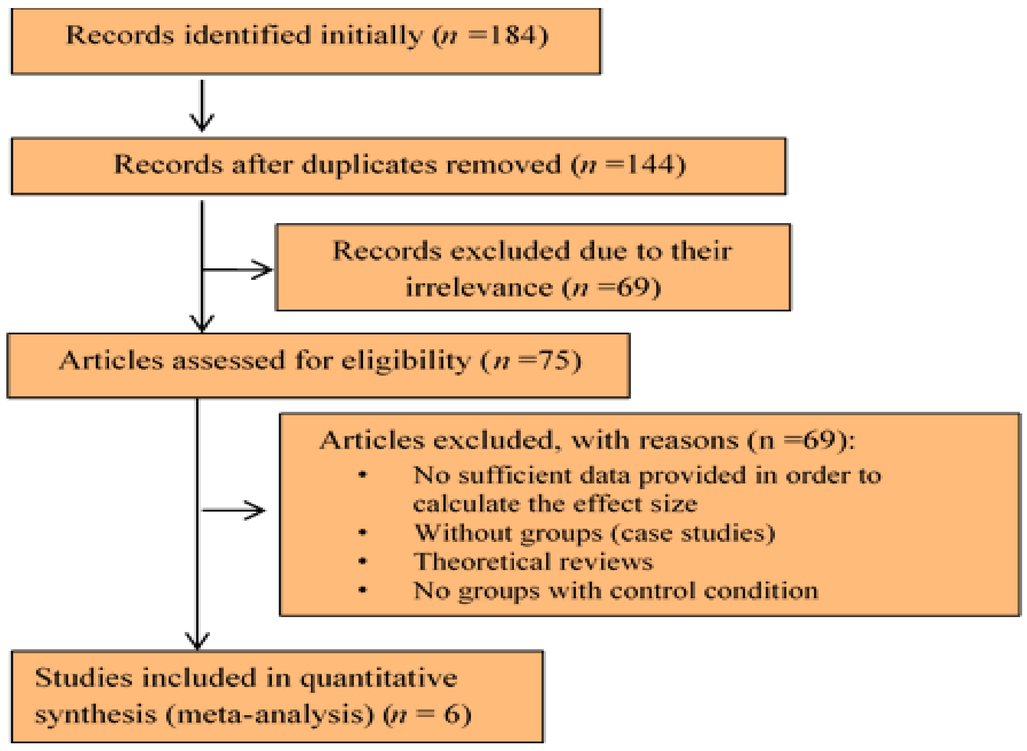

Figure 1. PRISMA Flow Chart

Results

Table 1
The effect sizes of researches

Authors	Year	Effect sizes	95% C.I.[min;max]	v
Dahl and Moreau	2002	-0.61	[-1.23;0.01]	0.10
Goldschmidt and Smolkov	2006	1.44	[0.13;2.75]	0.44
Çubukçu and Dündar	2007	0.94	[0.49;1.37]	0.05
Çubukçu and Cetinthara	2010	0.33	[-0.14;0.81]	0.05
Moreno et. al.	2014	0.28	[-0.17;0.74]	0.05
Althuizen and Wierenga	2014	0.53	[-0.09;1.16]	0.10

- k=6, 16 effect sizes, *N*= 410
- the effect of analogical thinking on creativity Cohen's D = 0.40, Var D = 0.13, p <.001, 95% CI = [0.18; 0.63]
- fail-safe N = 14
- evidence for heterogeneity, Q (5) = 18.82, p <.01, I^2 = 73.44

⟹
- no significant moderator, Q (4, 1)$_{between}$ = 0.08, p> .05
- removed the first extreme value, D = 0.56, VarD = 0.01, CI = [0.32; 0.80], Q(4) = 6.78, p> 0.05, I^2 = 41.02

Conclusion

- a significant medium effect of analogical reasoning on creativity
- we have found heterogeneity in the effect sizes ⟹ statistical analysis conducted did not find a significant moderator

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