

# How Do Testing Conditions Affect Creative Performance?

## Meta-Analyses of the Effects of Time Limits and Instructions

Sameh Said-Metwaly, Belén Fernández-Castilla, Eva Kyndt, and  
Wim Van Den Noortgate

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Testing conditions



Creative  
Performance

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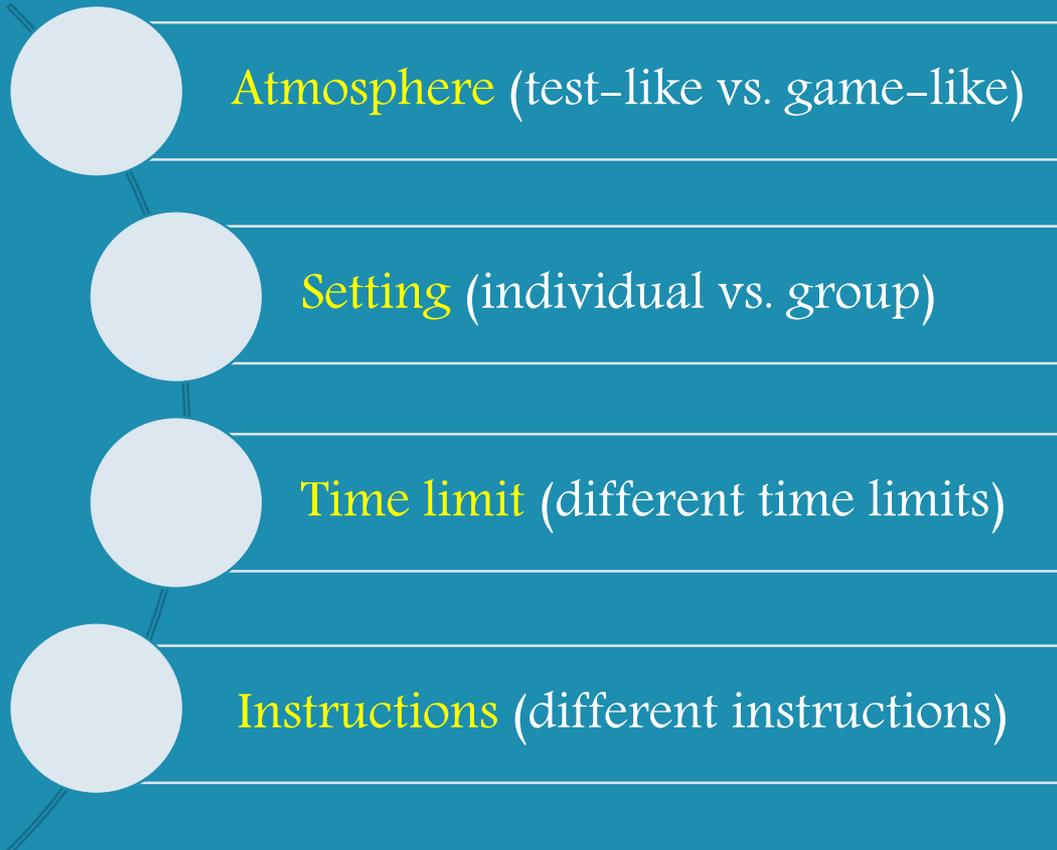


**How to create optimal conditions for testing creativity?**

Testing conditions



Creative  
Performance



*Time limits*

*Instructions*

most widely studied

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Short time **vs.** Long time

Timed **vs.** untimed

*Time limits*



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*Instructions*



Standard instructions **vs.** explicit  
instructions to “be creative”

*Time limits*

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Standard instructions **vs.** explicit  
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*e.g.:*

- How many *uses* of pencil you can think of? (**standard**)
- How many *creative uses* of pencil you can think of? (**explicit**)

*Time limits*

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Short time *vs.* Long time  
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Inconsistent results

*Objective*

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- (1) Does the manipulation of time limits (short vs. long) affect creative performance?
- (2) Does the manipulation of instructions (standard vs. explicit “be creative”) affect creative performance?
- (3) Which variables moderate the effect of time limits or instructions on creative performance?

*Hypotheses*

*Time limits*

Creativity ~ *Combinatorial process* (Amabile et al., 2002)

*Hypotheses*

*Time limits*

Creativity ~ *Combinatorial process* (Amabile et al., 2002)

Shaping multiple  
associations among concepts



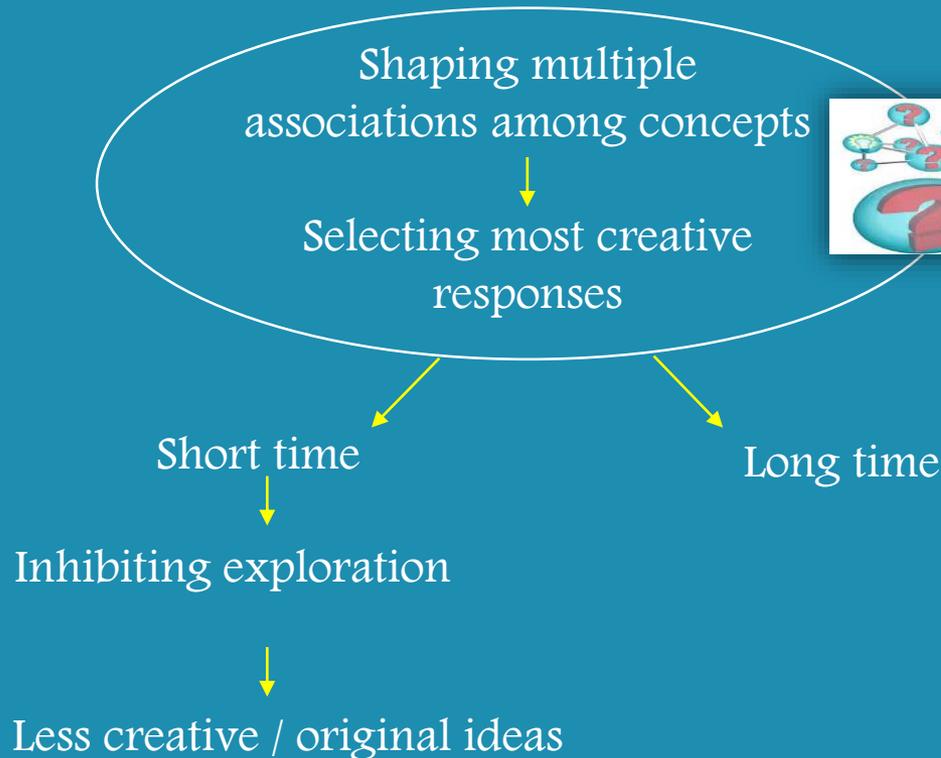
Selecting most creative  
responses



*Hypotheses*

**Time limits**

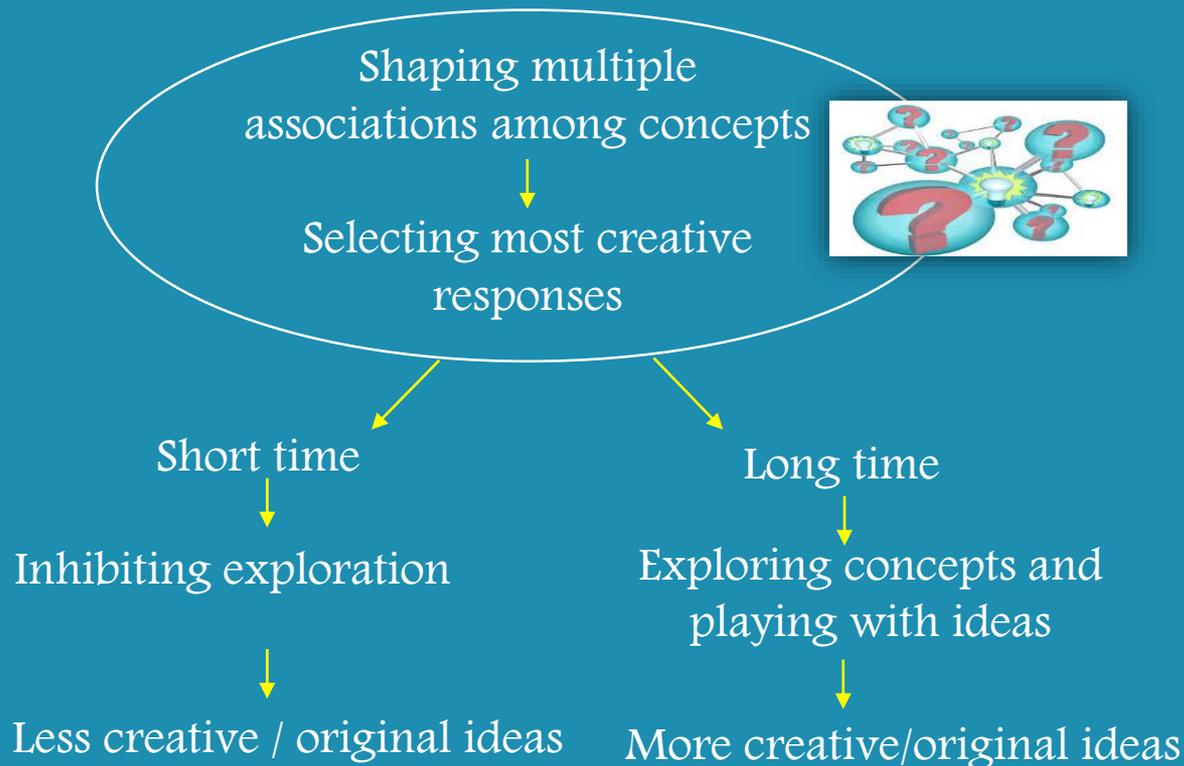
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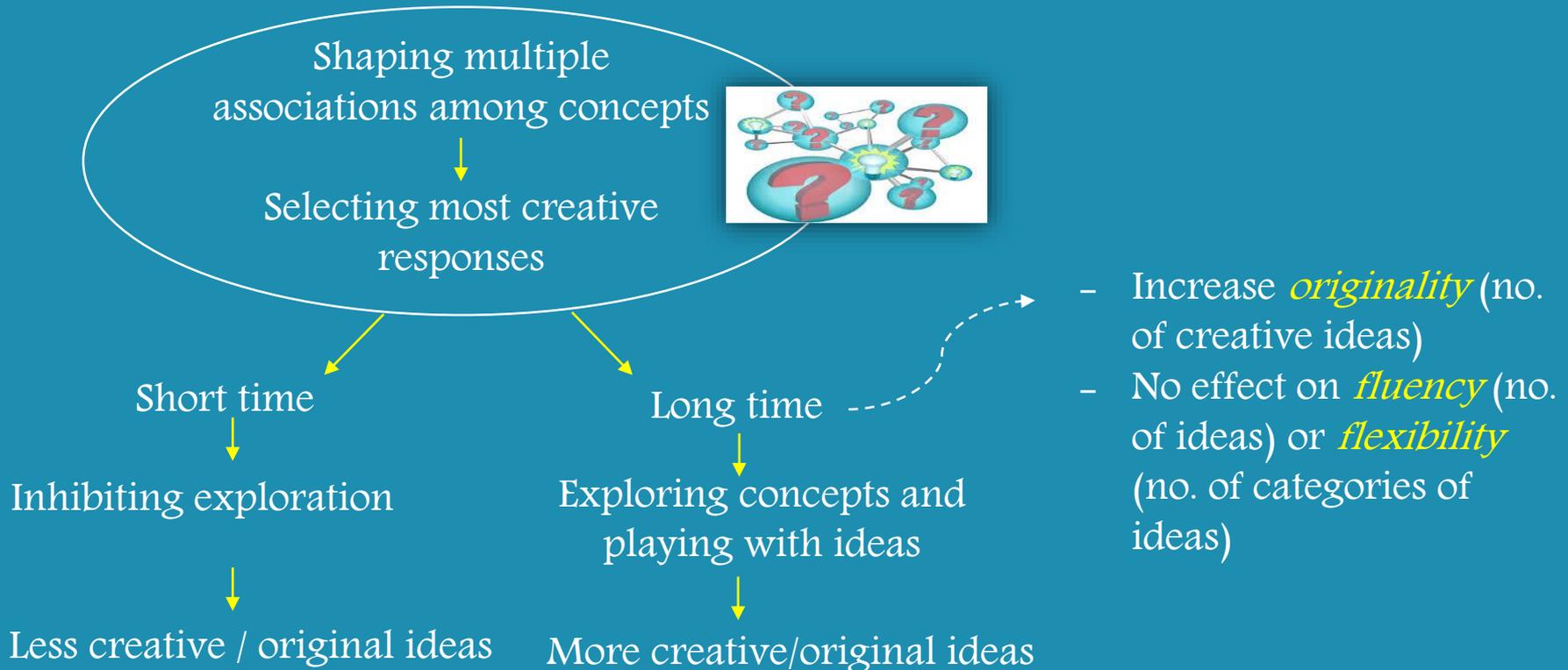
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*Hypotheses*

Instructions

The *path of least resistance hypothesis (PLR)* (Ward (1994))

*Hypotheses*

Instructions

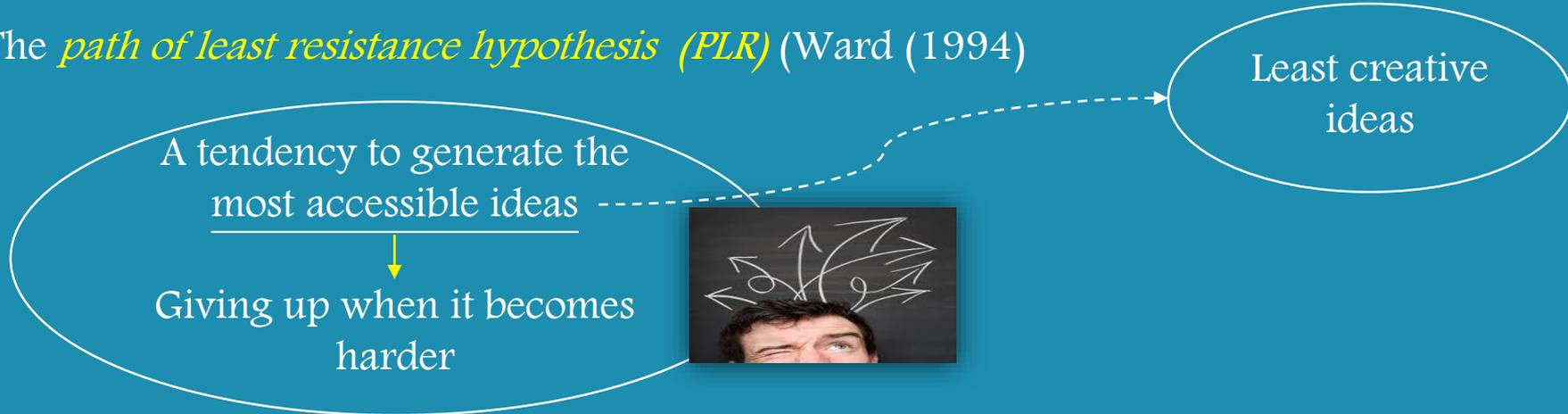
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A tendency to generate the  
most accessible ideas

↓  
Giving up when it becomes  
harder



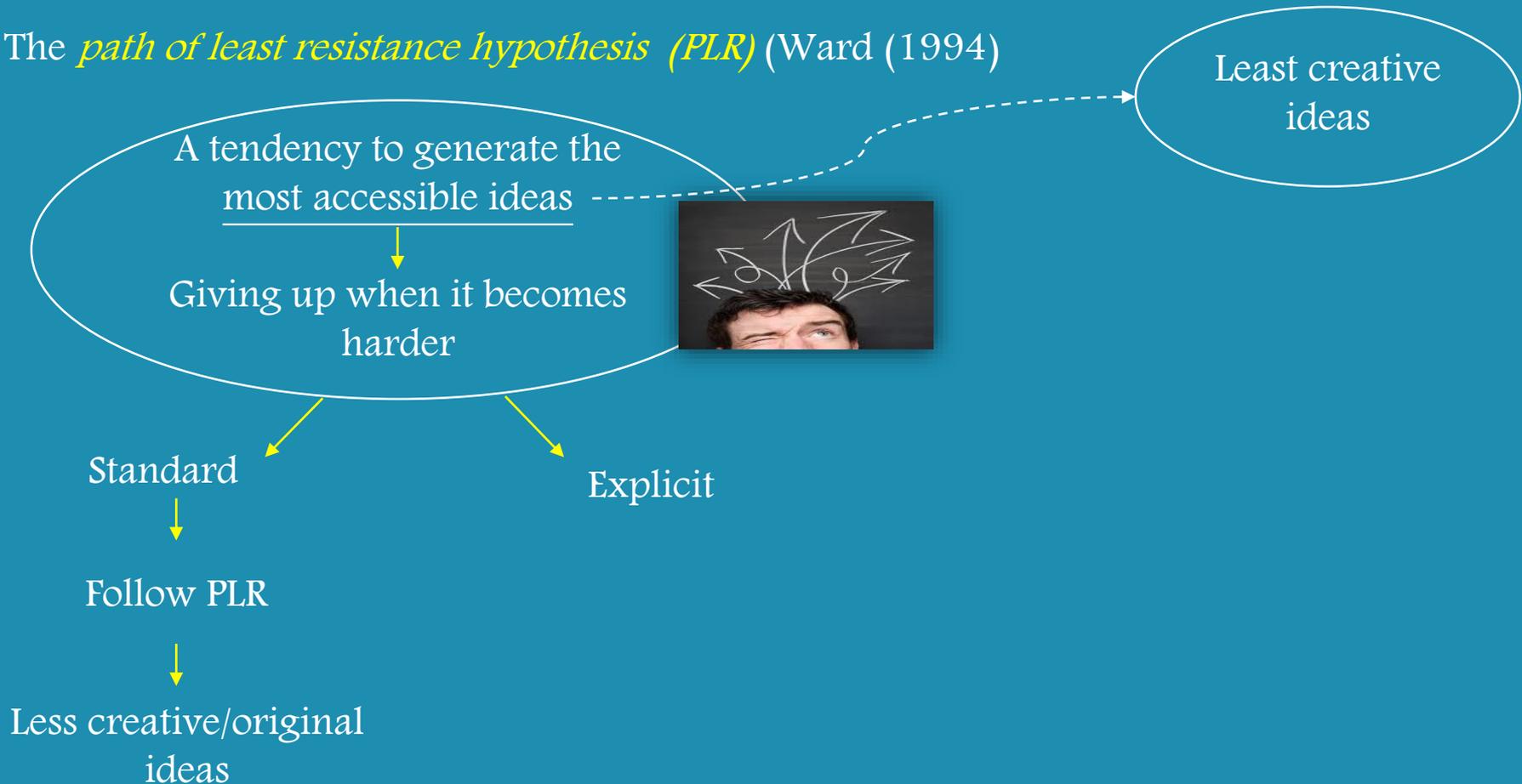
Least creative  
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*Hypotheses*

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*Hypotheses*

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Least creative ideas

A tendency to generate the most accessible ideas

Giving up when it becomes harder



Standard

Explicit

Follow PLR

Skip PLR

Extended exploration strategy

Less creative/original ideas

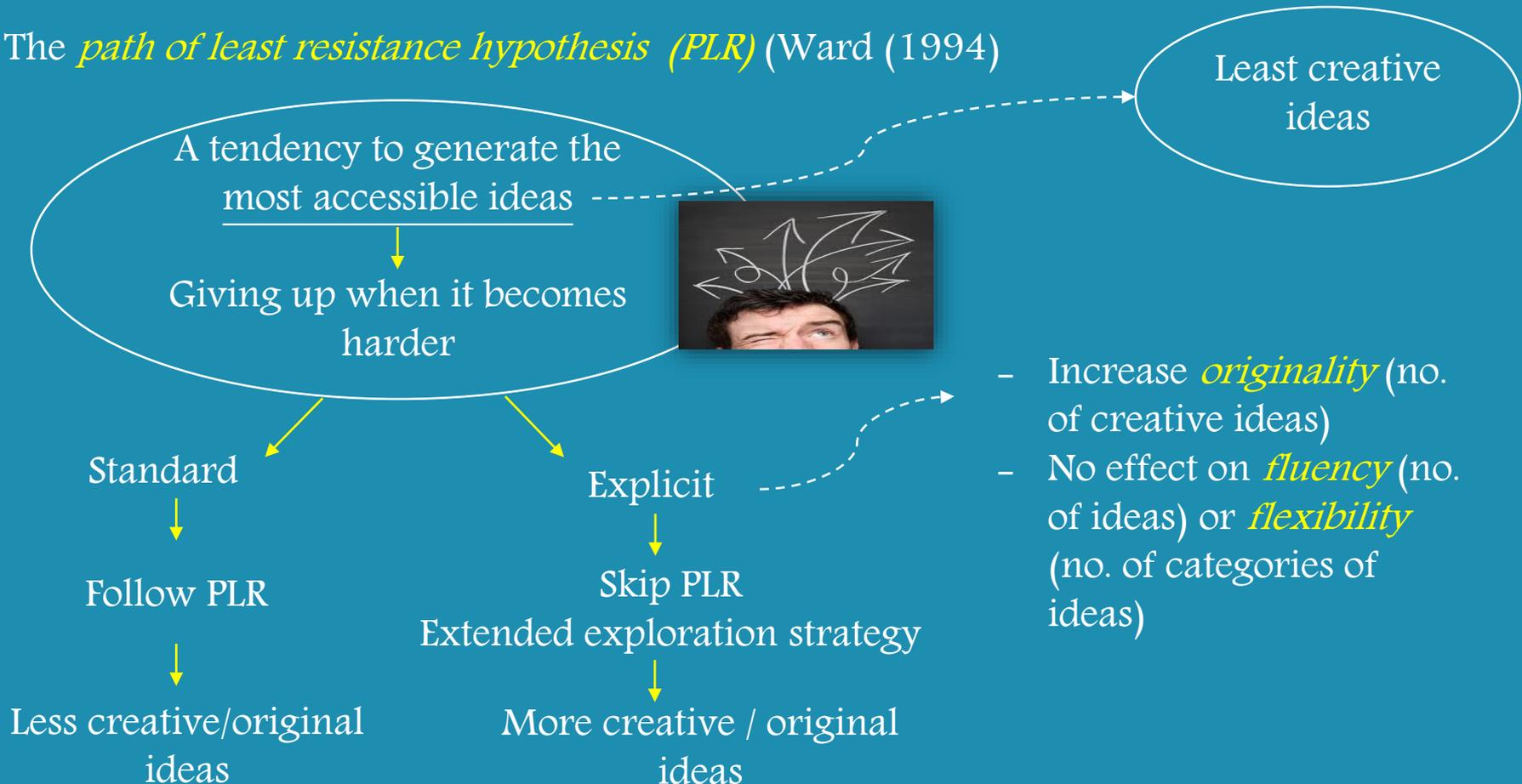
More creative / original ideas



Hypotheses

Instructions

The *path of least resistance hypothesis (PLR)* (Ward (1994))



*Method***Data Sources**

- **Databases:** ERIC, JSTOR, PsycARTICLES, and Web of Science.
- **Key journals:** *Creativity Research Journal, Gifted Child Quarterly, Psychology of Aesthetics, Creativity, and the Arts, The Journal of Creative Behavior, and Thinking Skills and Creativity.*
- **Backward search** (Bibliographies of relevant studies)
- **Forward search** (Searching databases for papers that referred to relevant papers)

*Method***Criteria for including studies**

- ✓ Journal articles, conference papers, or dissertations.
- ✓ Published up to May 31<sup>st</sup>, 2017.
- ✓ Written in English.
- ✓ Address the effect of time limits (short vs. long) and/or instructions (standard vs. explicit) on creative performance.
- ✓ Report the statistics needed to calculate the effect size (e.g.,  $M$  and  $SD$ ,  $t$ ,  $F$ , or  $d$ ).

*Method***Moderator variables**

- Culture (USA / Non-USA)
- Gender (% male)
- Measurement approach (process / product)
- Domain of creativity (verbal / figural)
- Educational level (college / non-college)
- Quality (weak / moderate / strong) - - - - - → EPHPP (Thomas, Ciliska, Dobbins, & Micucci, 2004)

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**Analyses**

- Hedges'  $g$  for effect sizes
- A meta-analytic three-level model  
(between-study/ within-study / sampling variances)
- A sensitivity analysis for outliers
- Funnel plots and Egger's regression test for publication bias

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- 9 studies (35 effect sizes)
- Overall analysis
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  - Significant mean effect size for *originality* (0.88,  $p = .04$ ) in favor of long time limits.
  - Not significant for fluency (1.41,  $p = .11$ ) and flexibility (0.74,  $p = .22$ ).

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- Moderator variables: None was significant .

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  - Not significant for *fluency* (0.08,  $p = .82$ ) and *flexibility* (-1.38,  $p = .35$ ).
- Moderator variables: Only educational level significantly moderate the effects of instructions on fluency (49.62%) and originality (60.85%).

*Sensitivity analysis*

\* Extreme effect sizes ( $2 SD >$  or  $<$  mean)

*Time limits*

- Overall analysis (3)
- Subscale analyses (0)

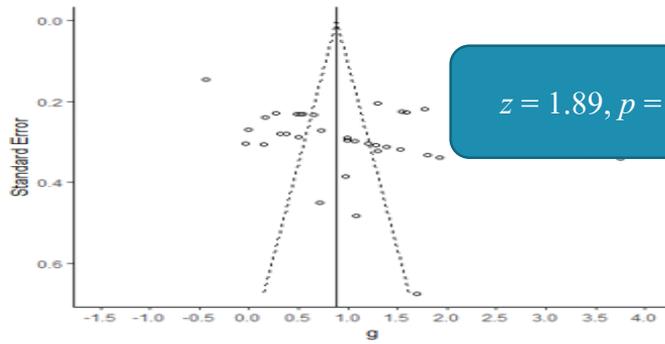
*Instructions*

- Overall analysis (7)
- Subscale analyses [fluency (1), originality (2), flexibility (0)]

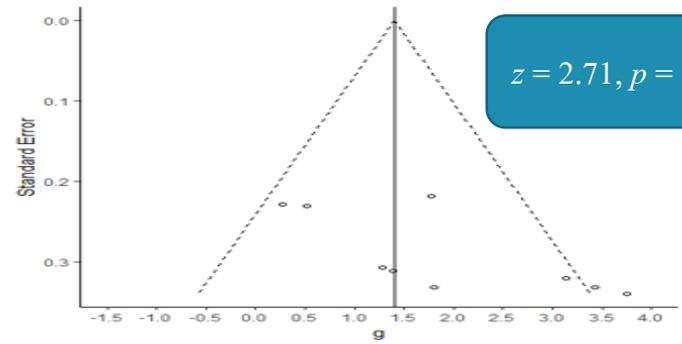
Estimates were fairly robust

*Publication bias  
Time limits*

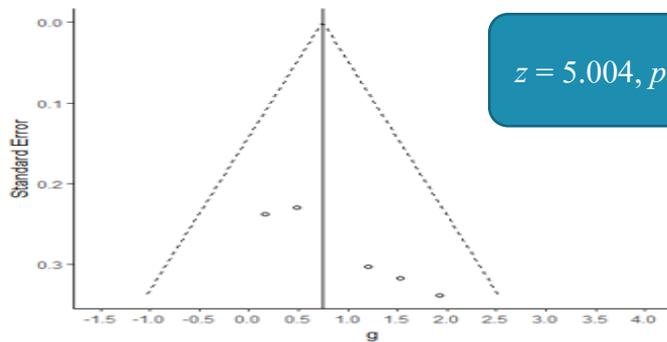
Overall analysis



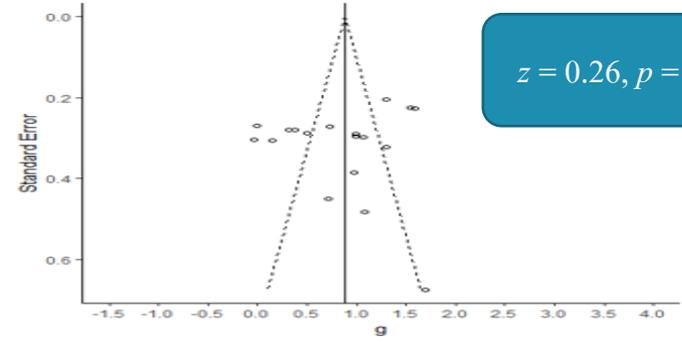
Fluency



Flexibility

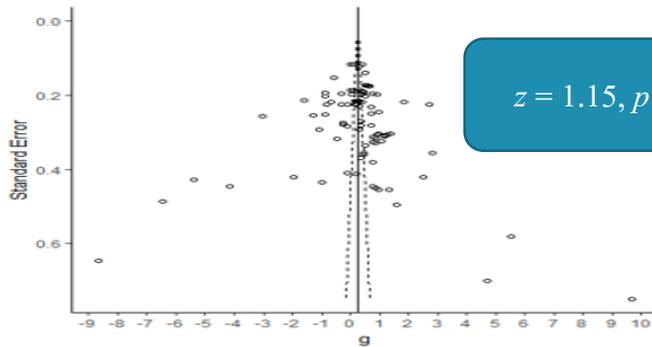


Originality

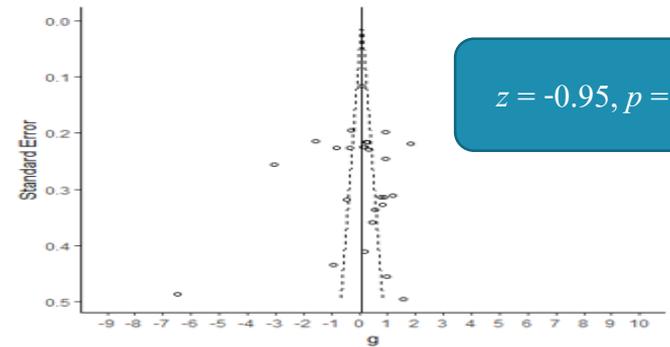


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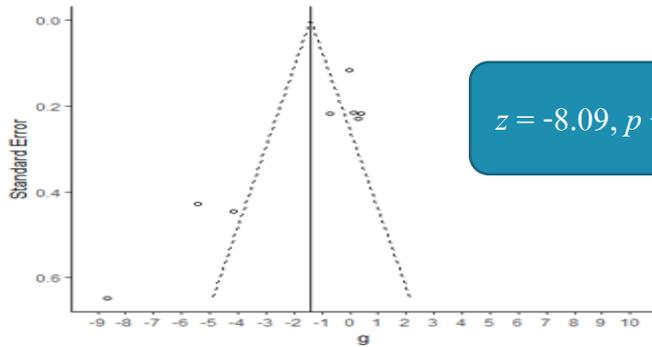
Overall analysis



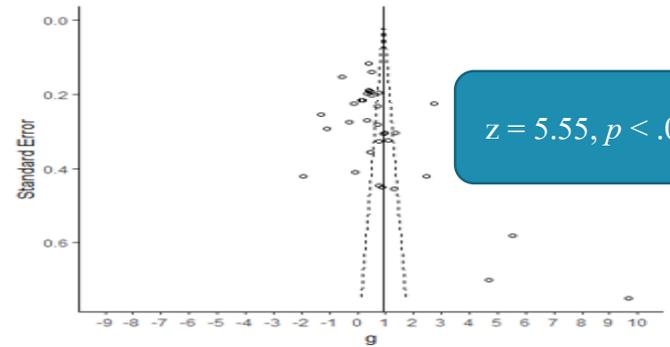
Fluency



Flexibility



Originality



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- Considering testing conditions when comparing results of studies.
- Feasibility of applying the three level model to study variations between and within studies.

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- More studies on school age children.

