

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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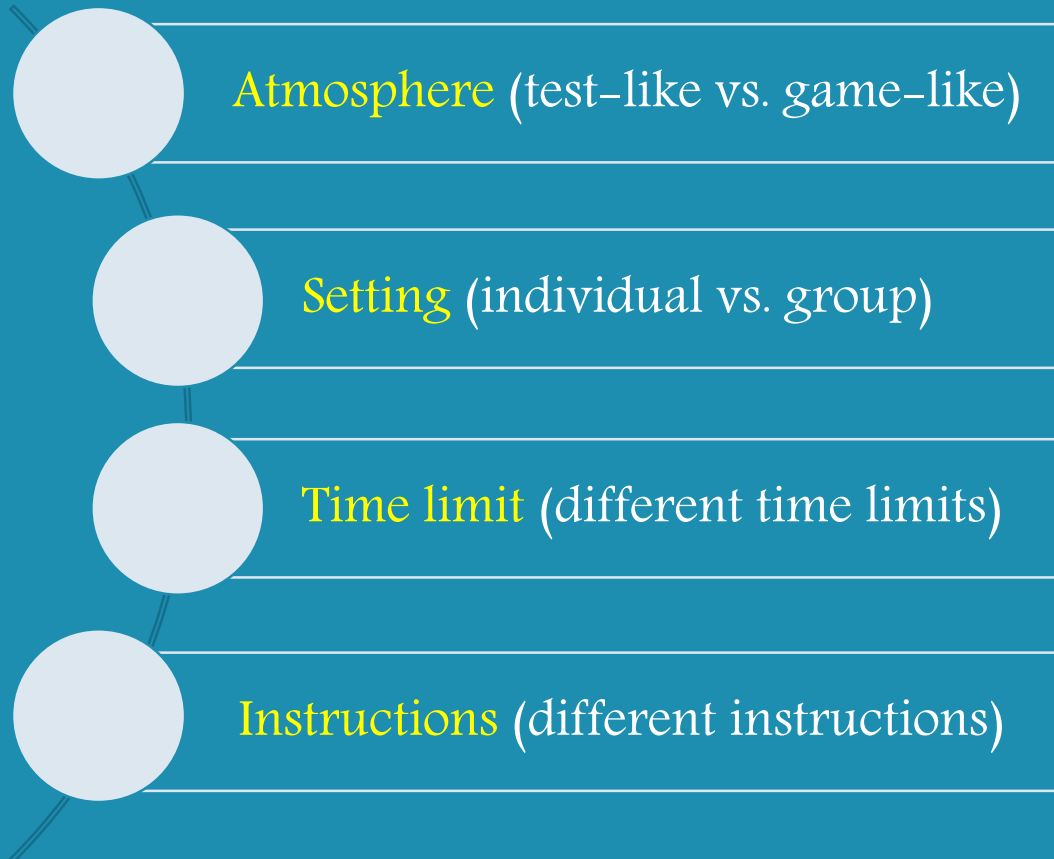


How to create optimal conditions for testing creativity?

Testing conditions



Creative
Performance



Time limits

Instructions

most widely studied

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most widely studied

Short time **vs.** Long time

Timed **vs.** untimed

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**Instructions*

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Short time *vs.* Long time
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Standard instructions *vs.* explicit
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- How many *uses* of pencil you can think of? (*standard*)
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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*

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Shaping multiple
associations among concepts



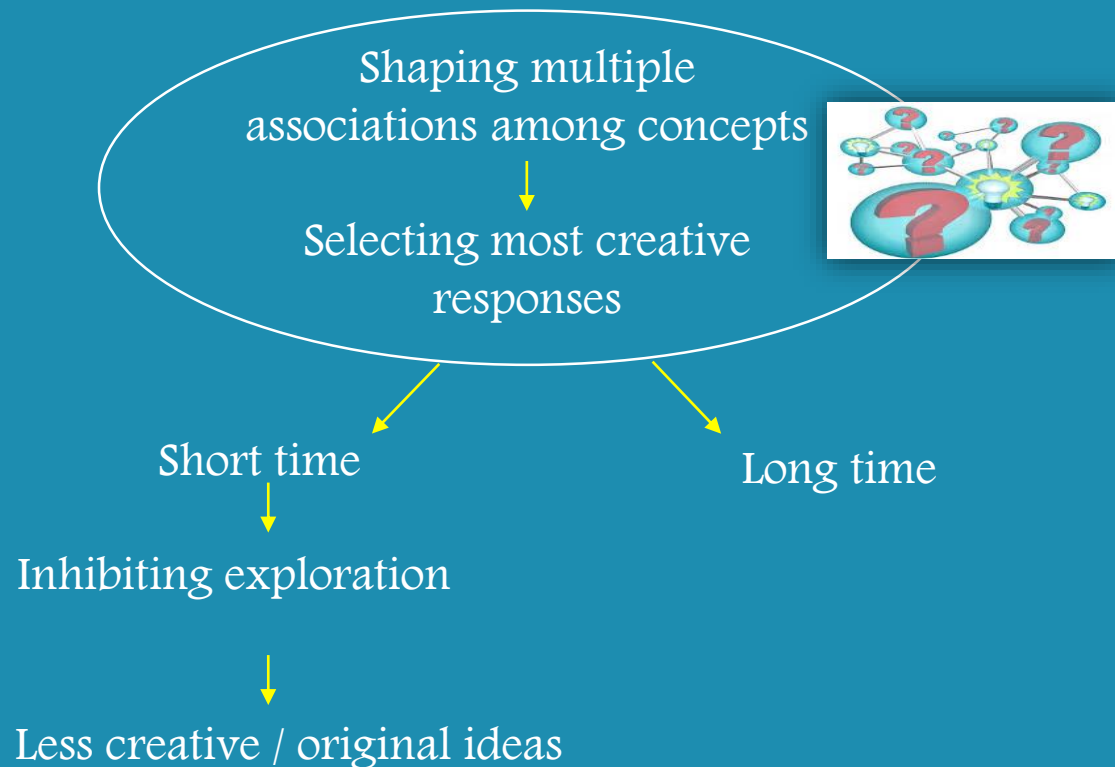
Selecting most creative
responses



Hypotheses

Time limits

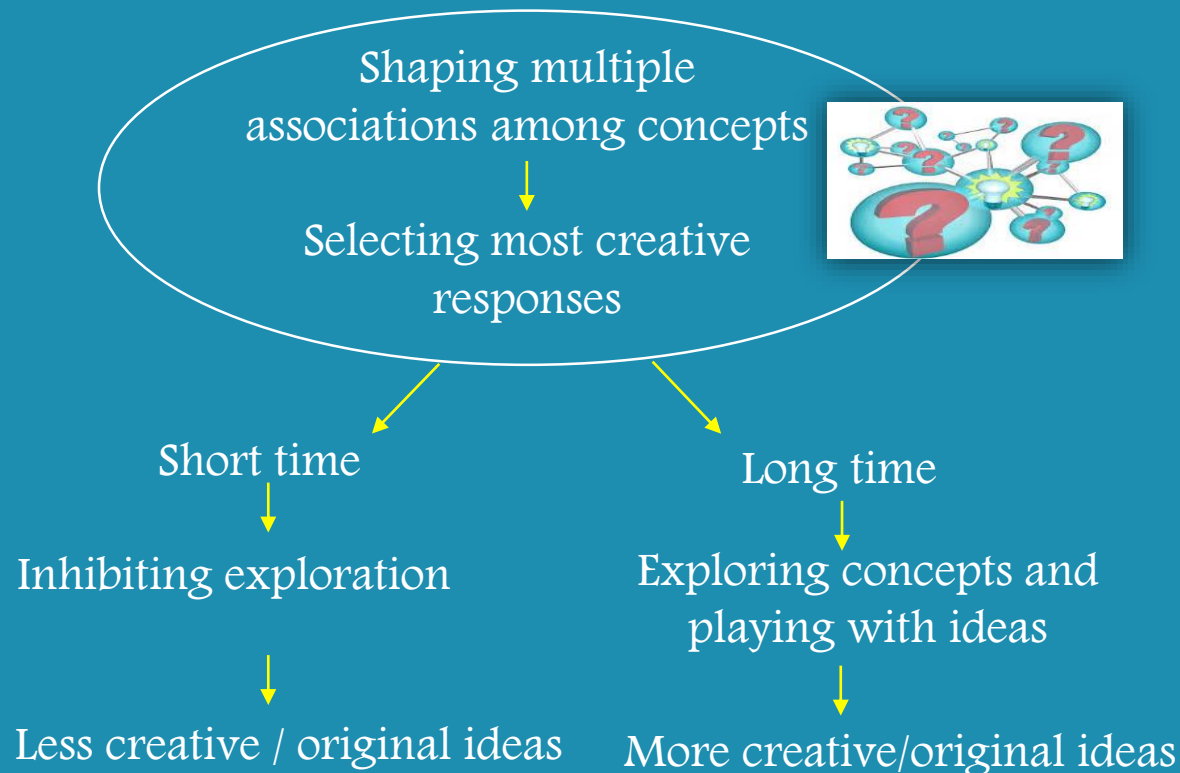
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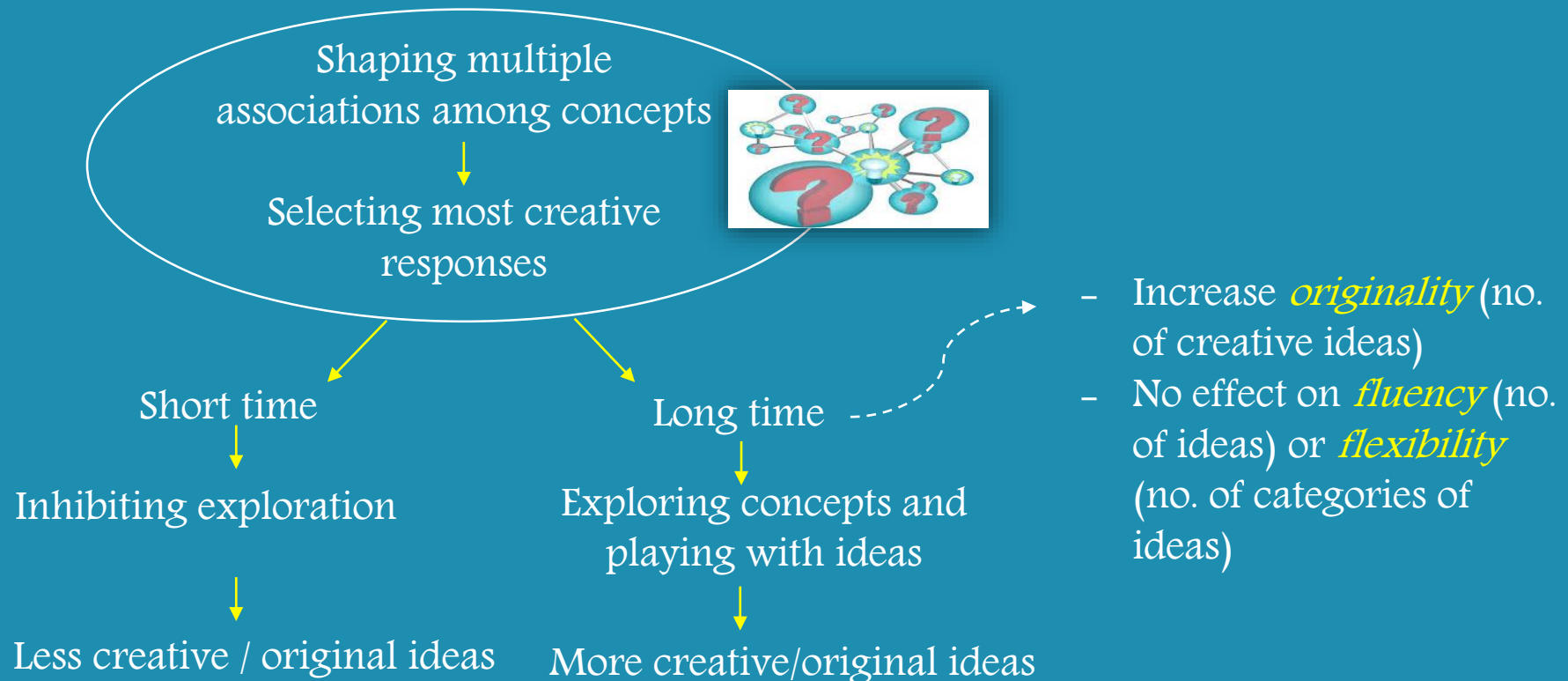
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Hypotheses

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Hypotheses

Instructions

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

Hypotheses

Instructions

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

A tendency to generate the
most accessible ideas

↓
Giving up when it becomes
harder

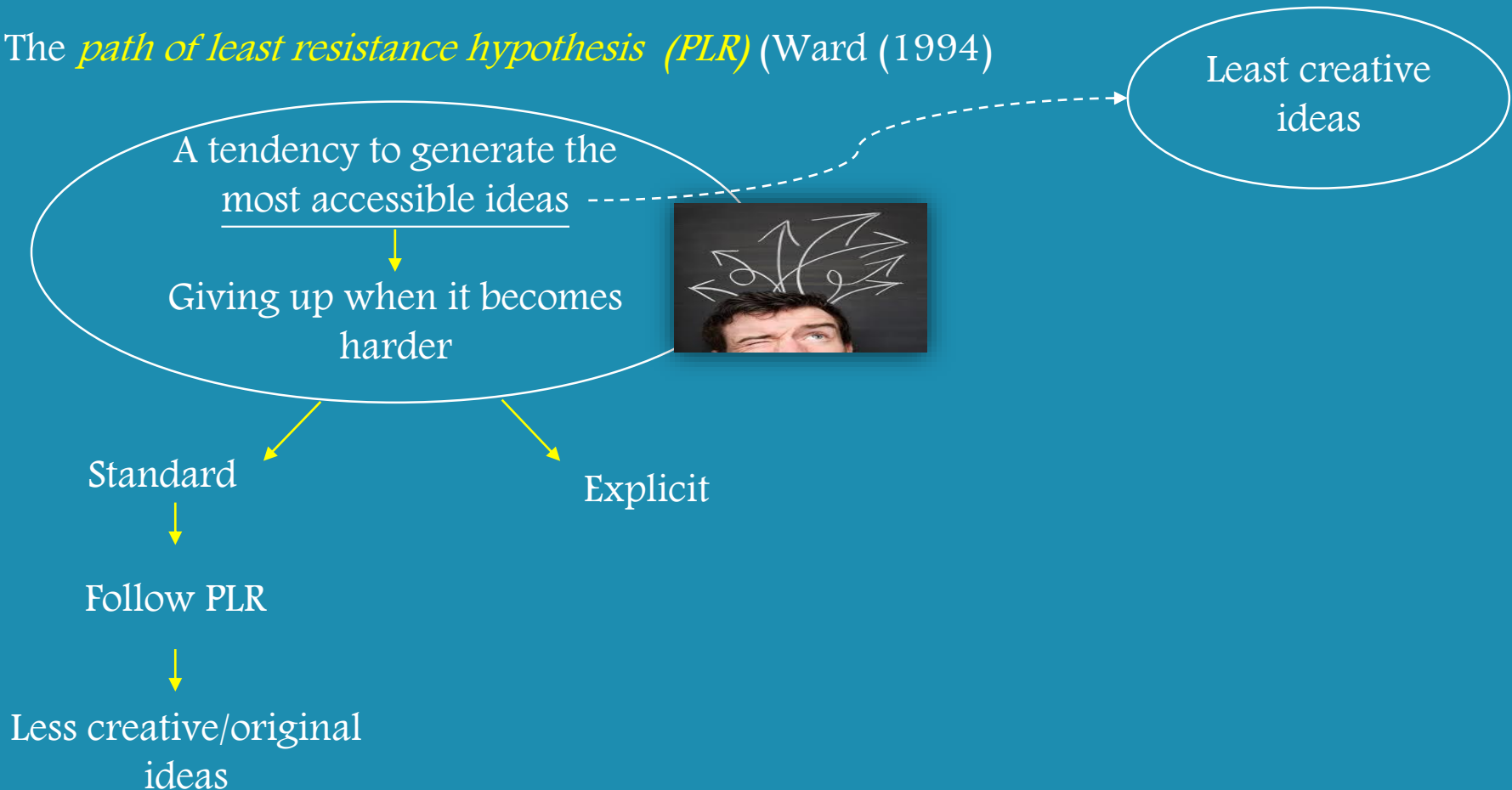


Least creative
ideas

Hypotheses

Instructions

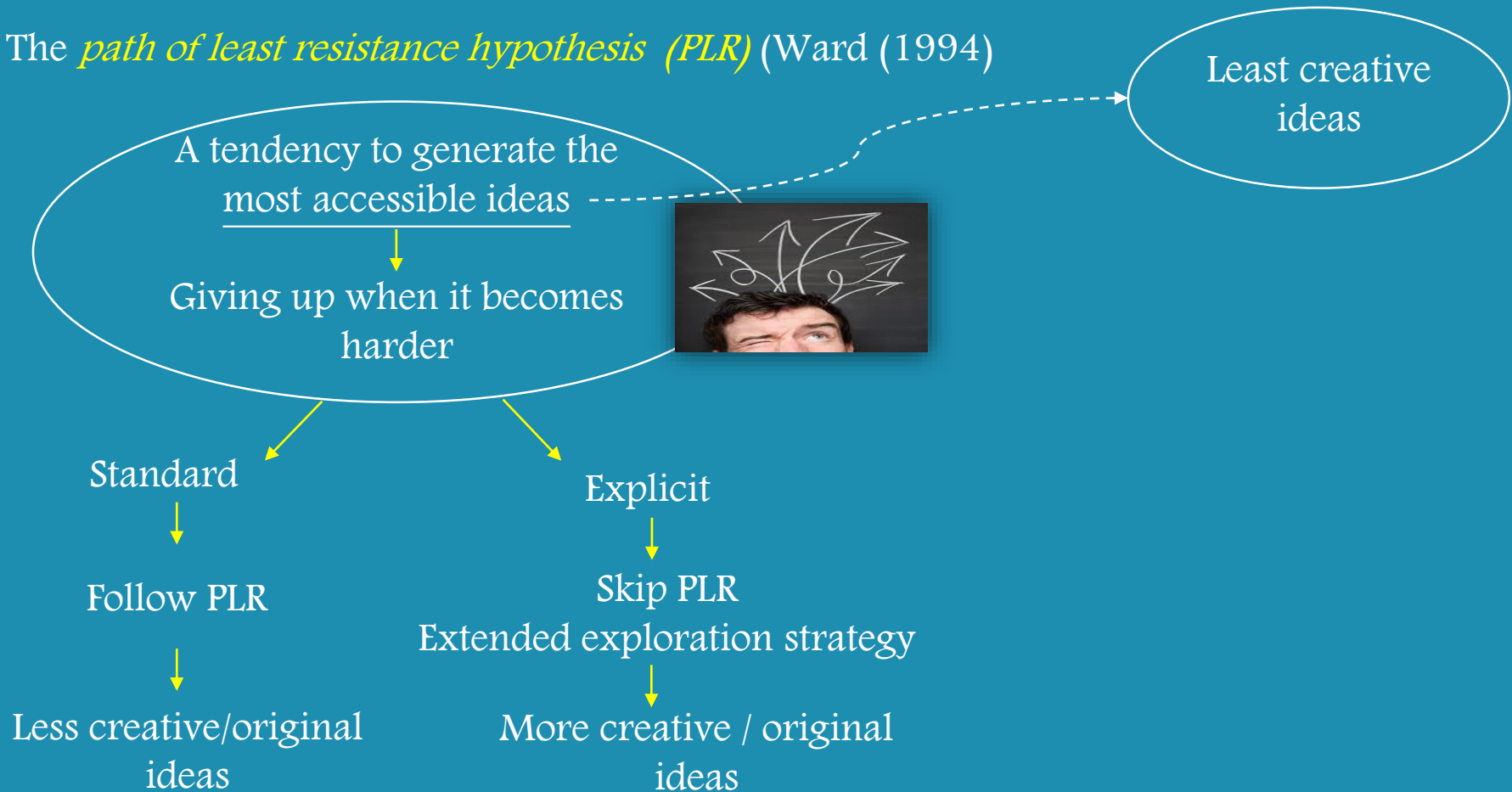
The *path of least resistance hypothesis (PLR)* (Ward (1994))



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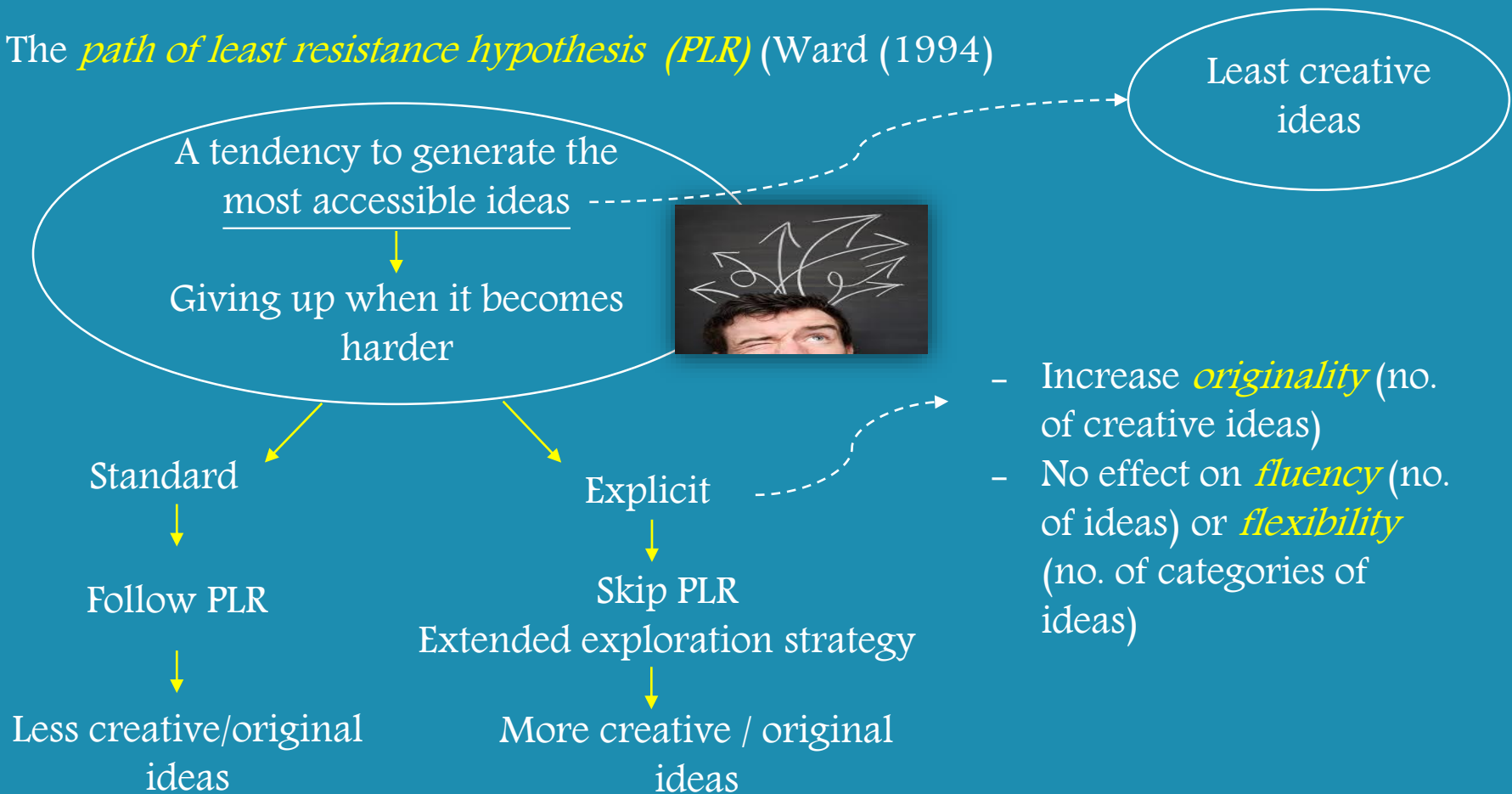
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Hypotheses

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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 31st, 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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- 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)

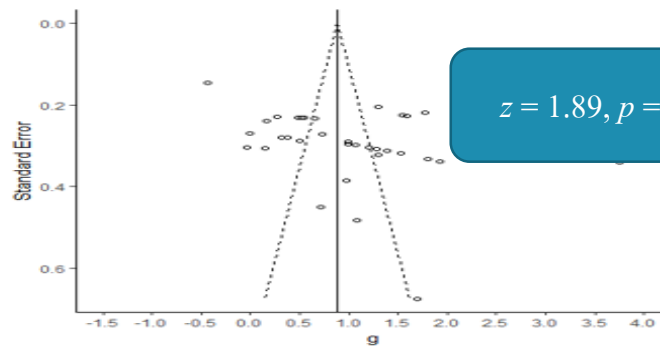
Instructions

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

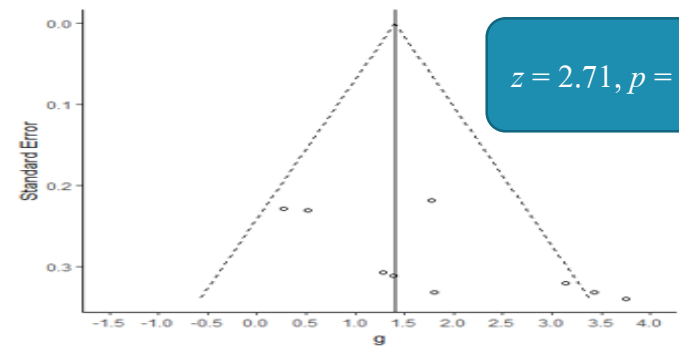
Estimates were fairly robust

Publication bias
Time limits

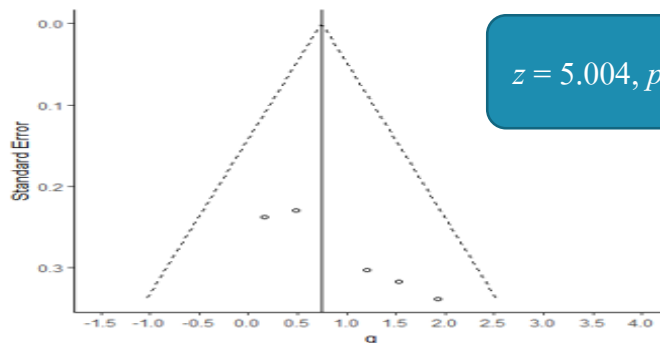
Overall analysis



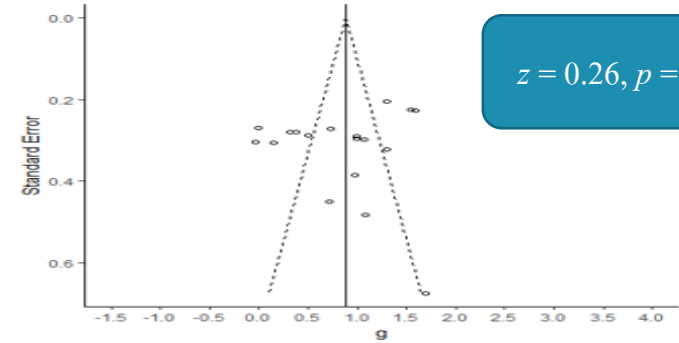
Fluency



Flexibility

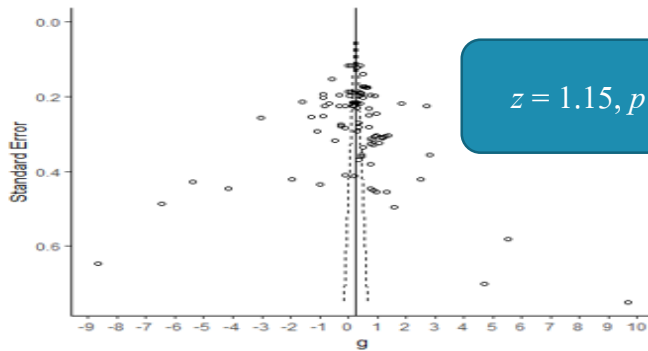


Originality



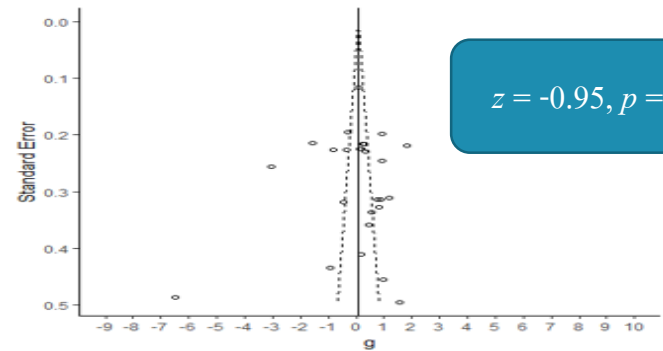
*Publication bias
Instructions*

Overall analysis



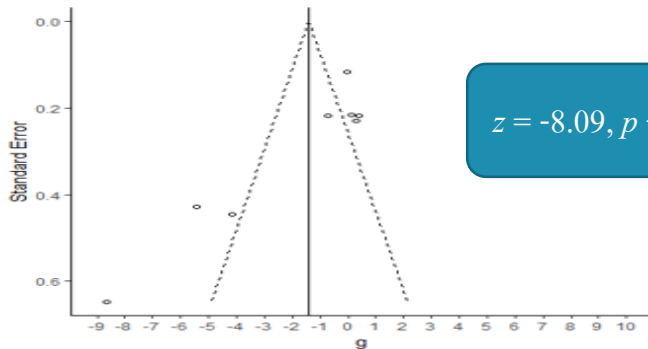
$z = 1.15, p = .25$

Fluency



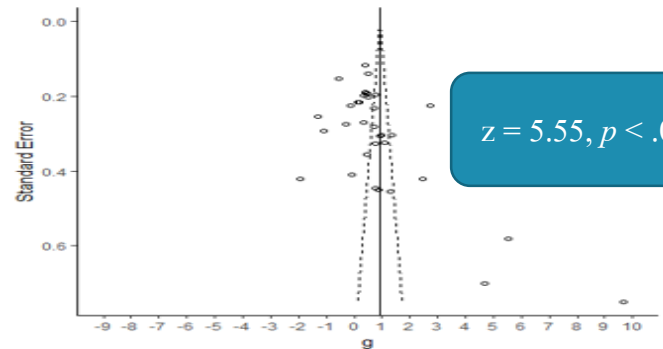
$z = -0.95, p = .34$

Flexibility



$z = -8.09, p < .0001$

Originality



$z = 5.55, p < .0001$

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- Time limits & instructions matter in measuring creativity (researchers and educators).
- Considering testing conditions when comparing results of studies.
- Feasibility of applying the three level model to study variations between and within studies.

*Future
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- Validating the moderating role of educational level.
- Investigating other creativity aspects (e.g., elaboration & abstractness of titles).
- More studies on school age children.

