Dépasser les « effets de stimuli » dans les tâches de pensée divergente:

indicateurs intra-individuels du « flux divergent»

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Plan

- **Créativié : approche multivariée**
- **Mesures classiques de la pensée divergente**
- **Parallelisme des taches de pensée divergente**
- **Mesure du « flux divergent »**

Defining and Measuring Creative Potential

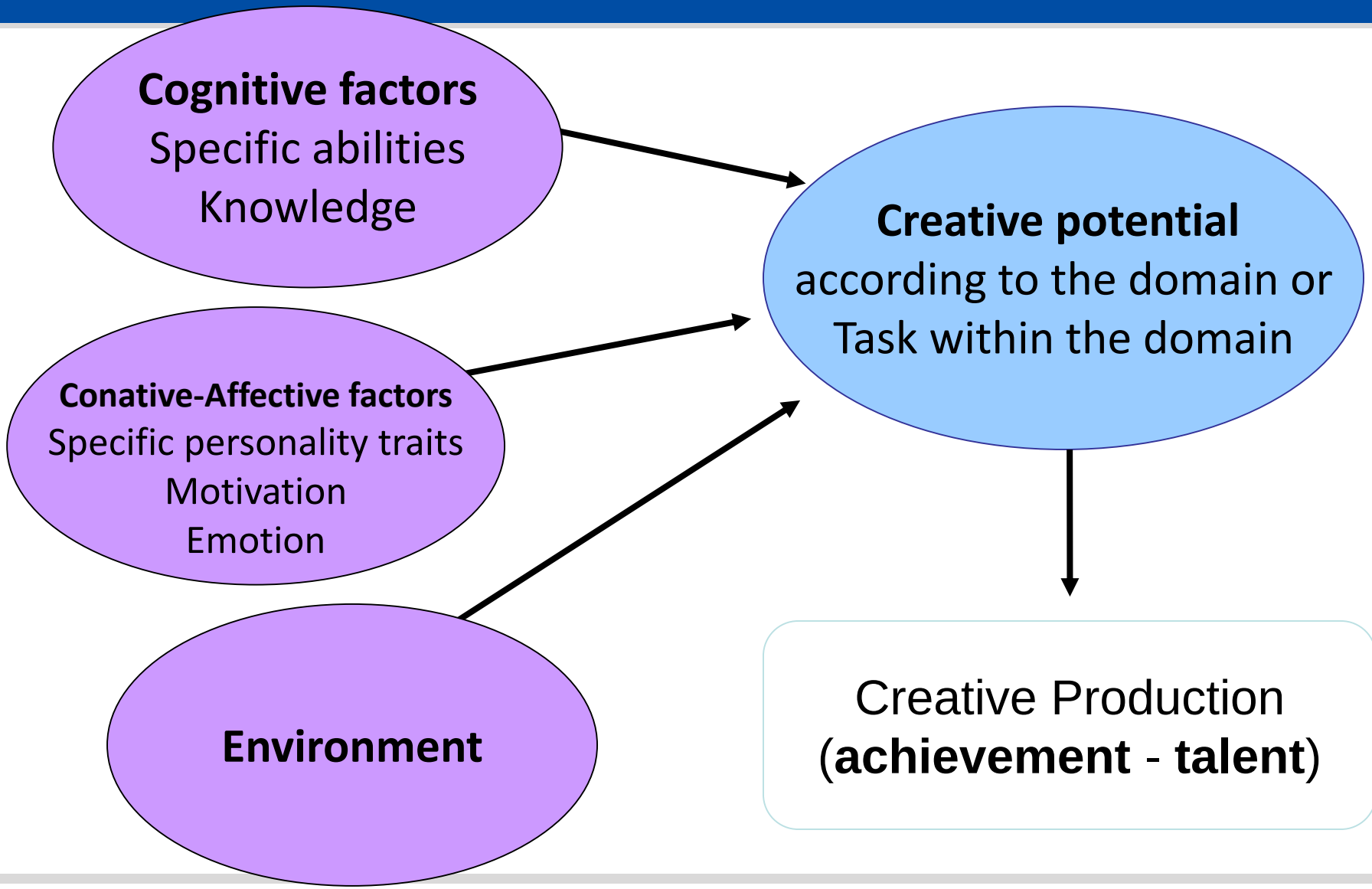
Definition

Creativity is the ability to produce work that is **both**:

- Novel/**Original**
- Context/domain/task **Appropriate**

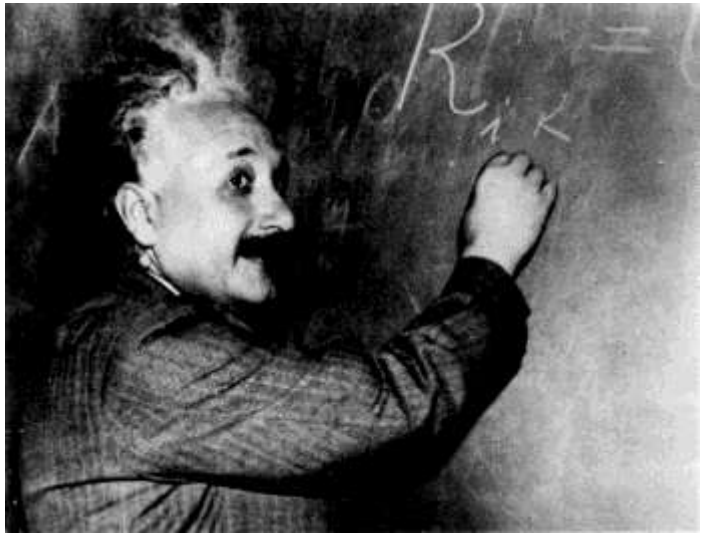
(e.g., Stein, 1953; Sternberg & Lubart, 1995)

“Componential” Approach



“Componential” Approach

- Big C vs. little c
- Domain specificity vs. generality



Two Thinking-Process Clusters

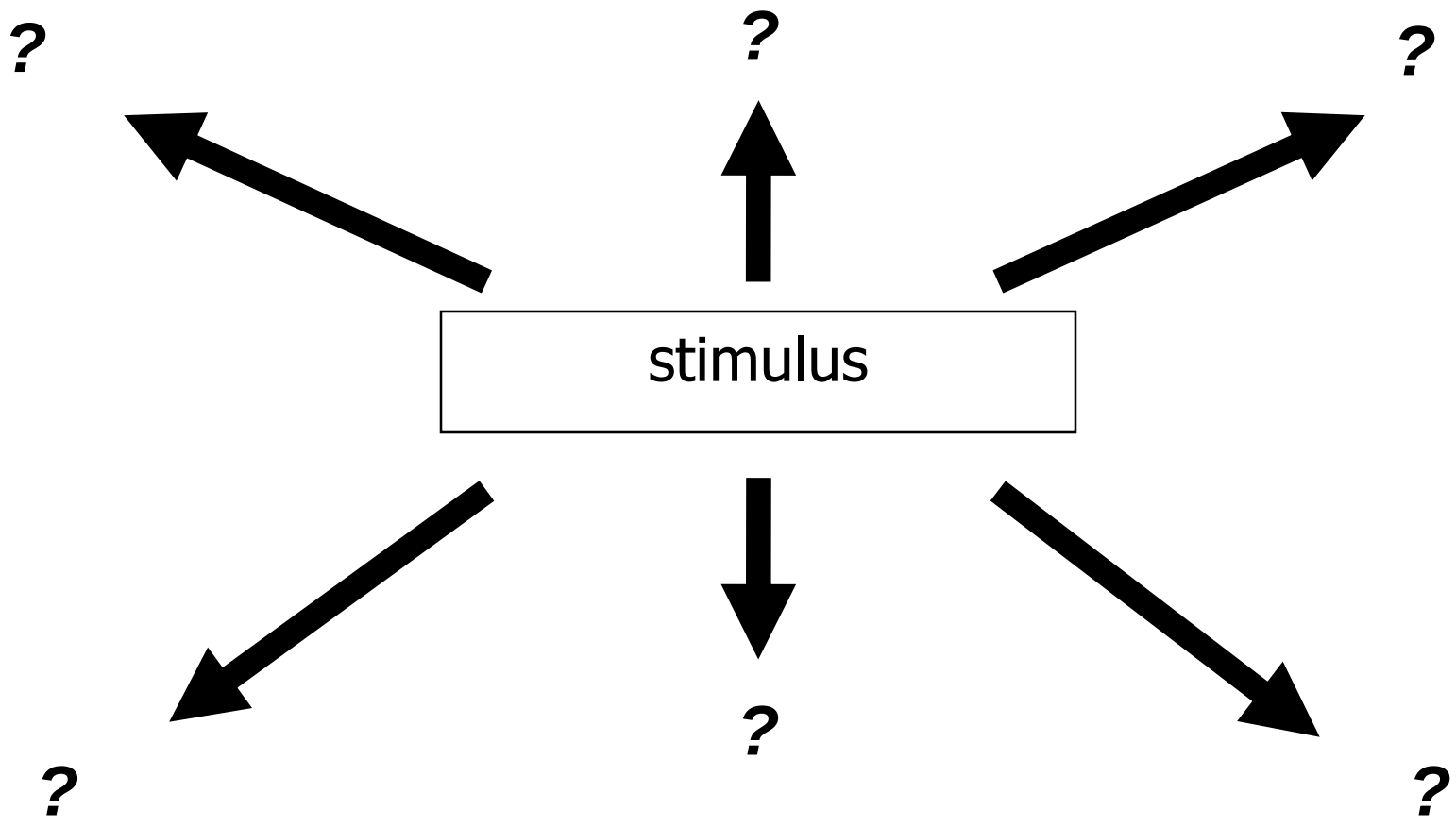
Divergent- exploratory:

- ability to produce many alternative solutions based on a single stimulus or problem

Convergent-integrative:

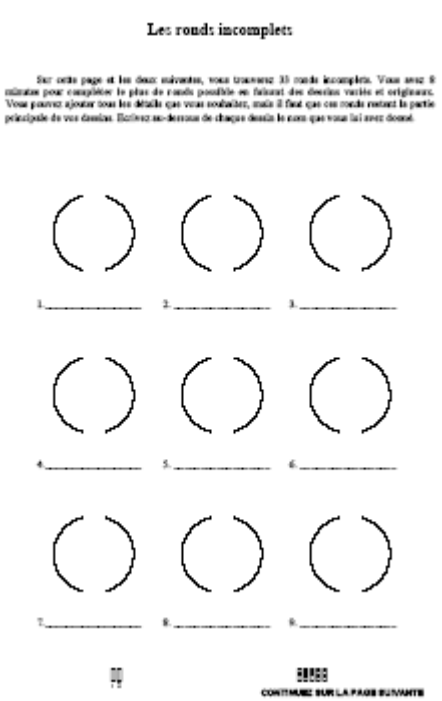
- ability to articulate or integrate multiple elements into a cohesive and original unit

Divergent-Exploratory thinking



Divergent-Exploratory thinking

- « **Incomplete circles** »

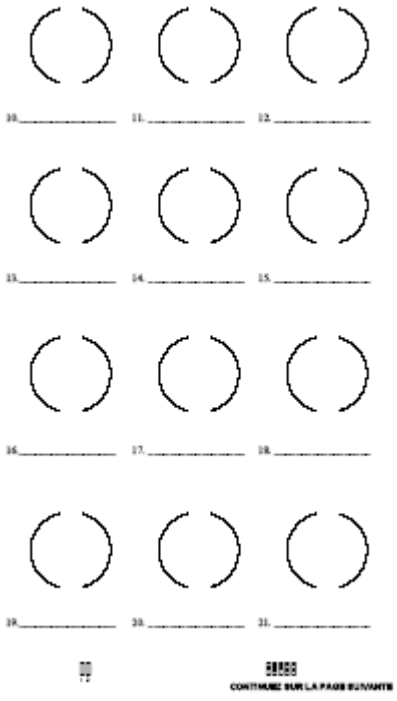


Les ronds incomplets

Sur cette page et les deux suivantes, vous trouverez 33 ronds incomplets. Vous avez 8 minutes pour compléter le plus de ronds possible en faisant des dessins variés et originaux. Vous pouvez ajouter tous les détails que vous souhaitez, mais il faut que ces ronds restent la partie principale de vos dessins. Écrivez au-dessous de chaque dessin le nom que vous lui avez donné.

1. 2. 3.
4. 5. 6.
7. 8. 9.

CONTINUEZ SUR LA PAGE SUIVANTE



10. 11. 12.
13. 14. 15.
16. 17. 18.
19. 20. 21.

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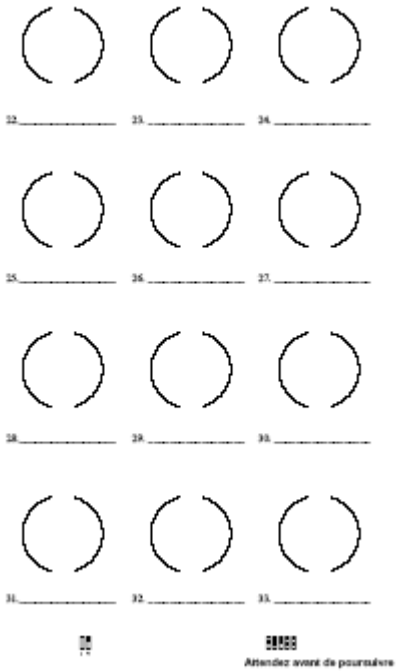
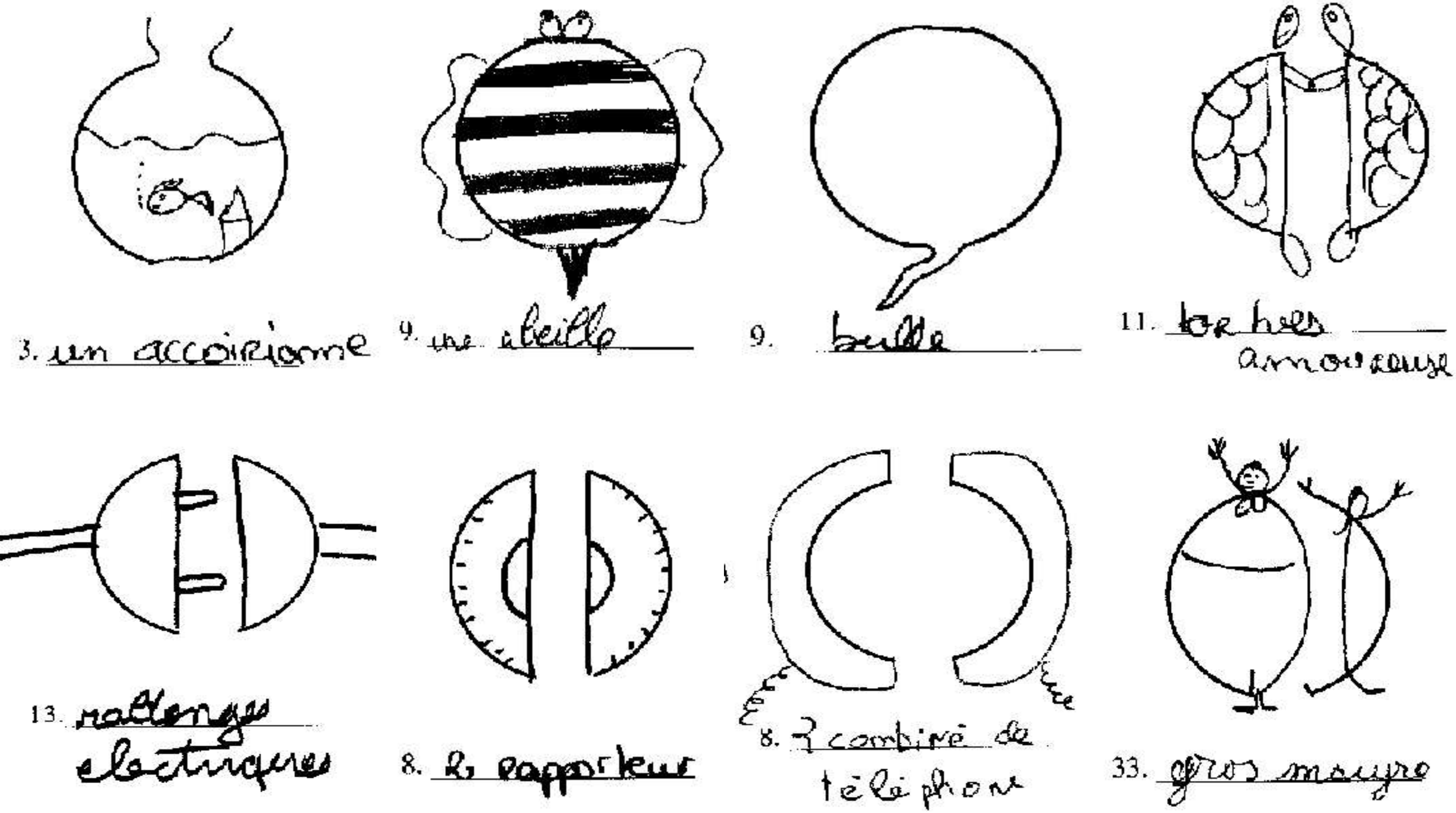


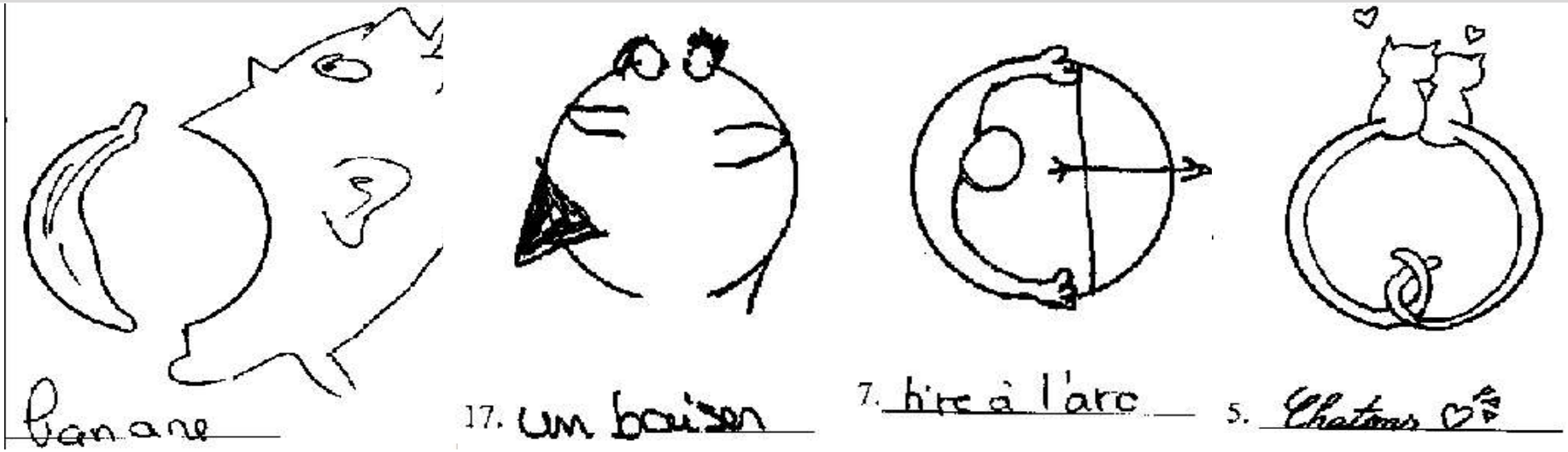
22. 23. 24.
25. 26. 27.
28. 29. 30.
31. 32. 33.

Attendez avant de poursuivre

Divergent-Exploratory thinking



Divergent-Exploratory thinking



- **Fluency** : many ideas
- **Flexibility:** different ideas
- **Originality** : rare ideas
- **Elaboration:** detailed ideas

Two Thinking-Process Clusters

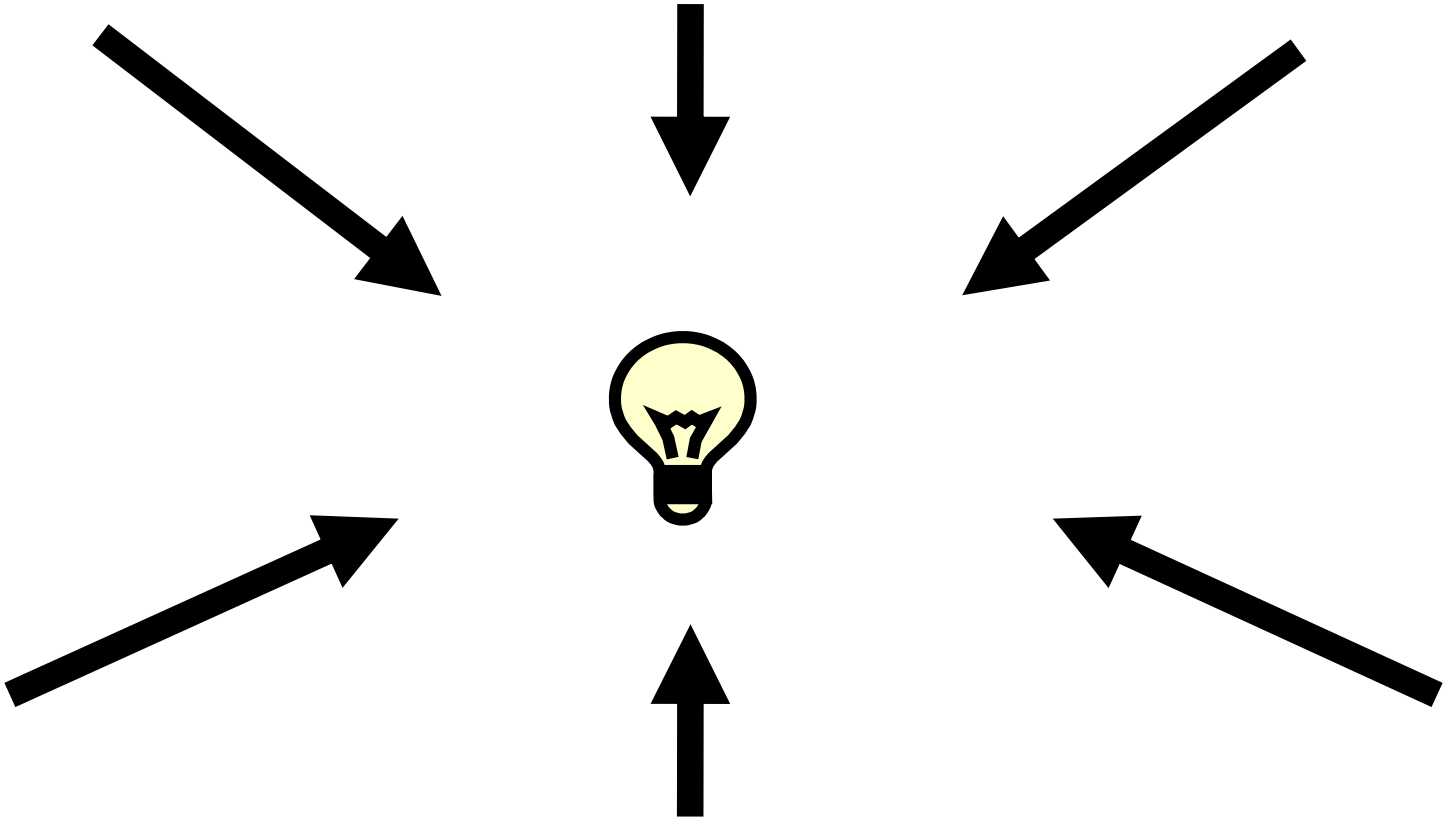
Divergent- exploratory:

- ability to produce many alternative solutions based on a single stimulus or problem

Convergent-integrative:

- ability to articulate or integrate multiple elements into a cohesive and original unit

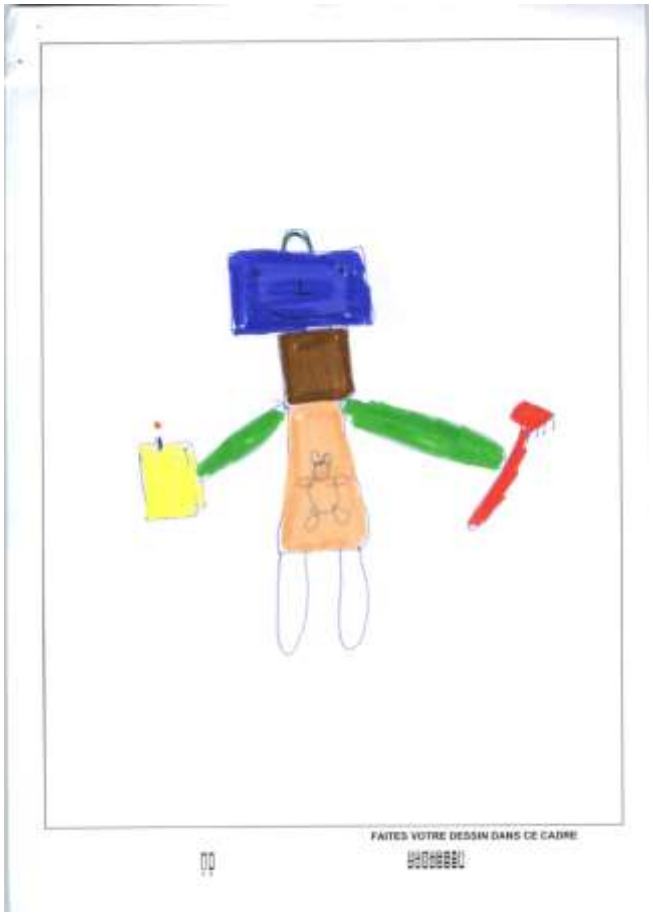
Convergent-Integrative thinking



EPoC : **E**valuation of **Po**tential for **C**reativity (Lubart, Besançon & Barbot, 2011)

Example: Integrative Graphic (IG)

EPoC : **E**valuation of **Po**tential for **C**reativity (Lubart, Besançon & Barbot, 2011)

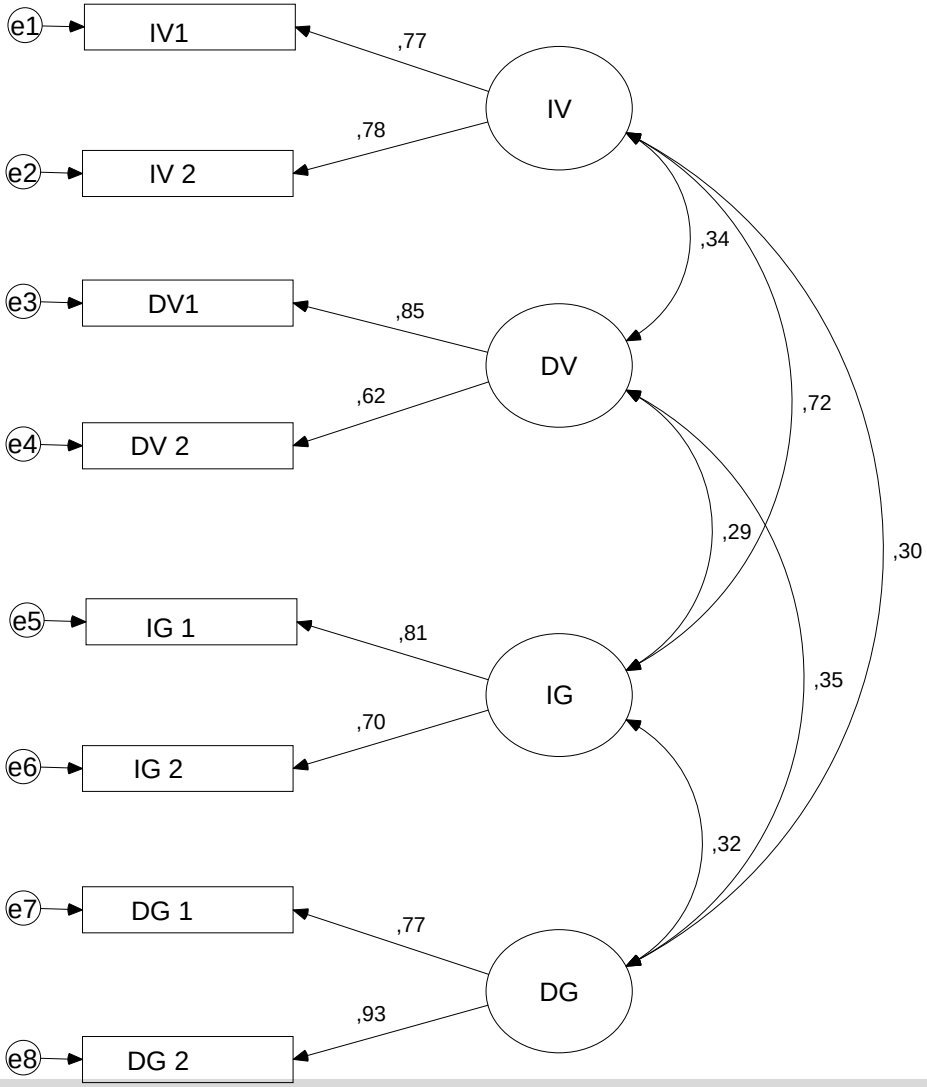


EPoC : **E**valuation of **Po**tential for **C**reativity (Lubart, Besançon & Barbot, 2011)

EPoC Structured Framework for Task Sampling

Domain	**Thinking Process**	
	Divergent-Exploratory	*Convergent-Integrative*
Graphic	DG1 - Abstract Stimulus	IG1 - Abstract Stimuli
	DG2 - Concrete Stimulus	IG2 - Concrete Stimuli
Verbal	DV1 - Story Endings	IV1 - Story Title
	DV2 - Story Beginnings	IV2 - Story Characters

EPoC : **E**valuation of **Po**tential for **C**reativity (Lubart, Besançon & Barbot, 2011)



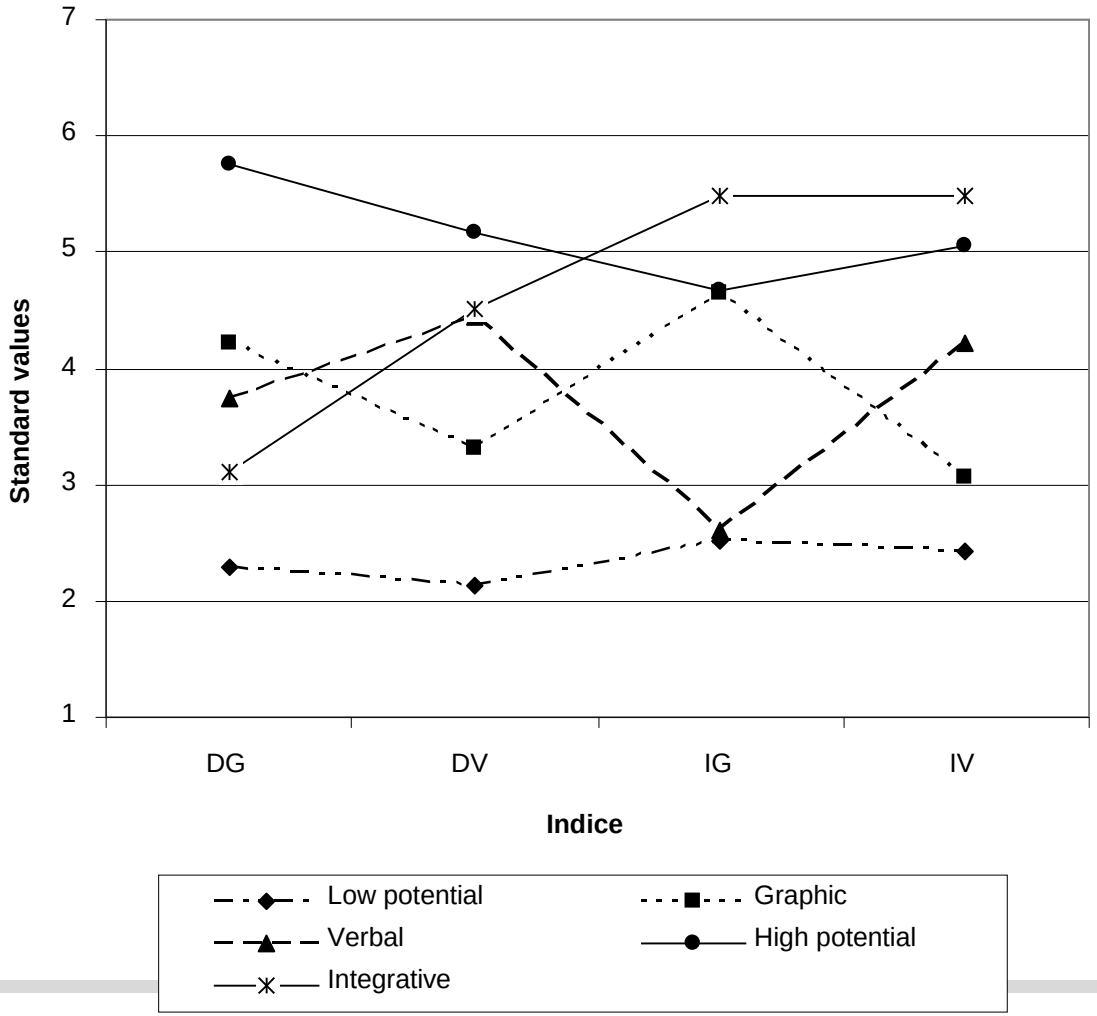
χ^2 = 32,5; dl = 14, $p < .05$;
χ^2 /dl = 2,3;

NFI = .94 ; CFI = .97 ;

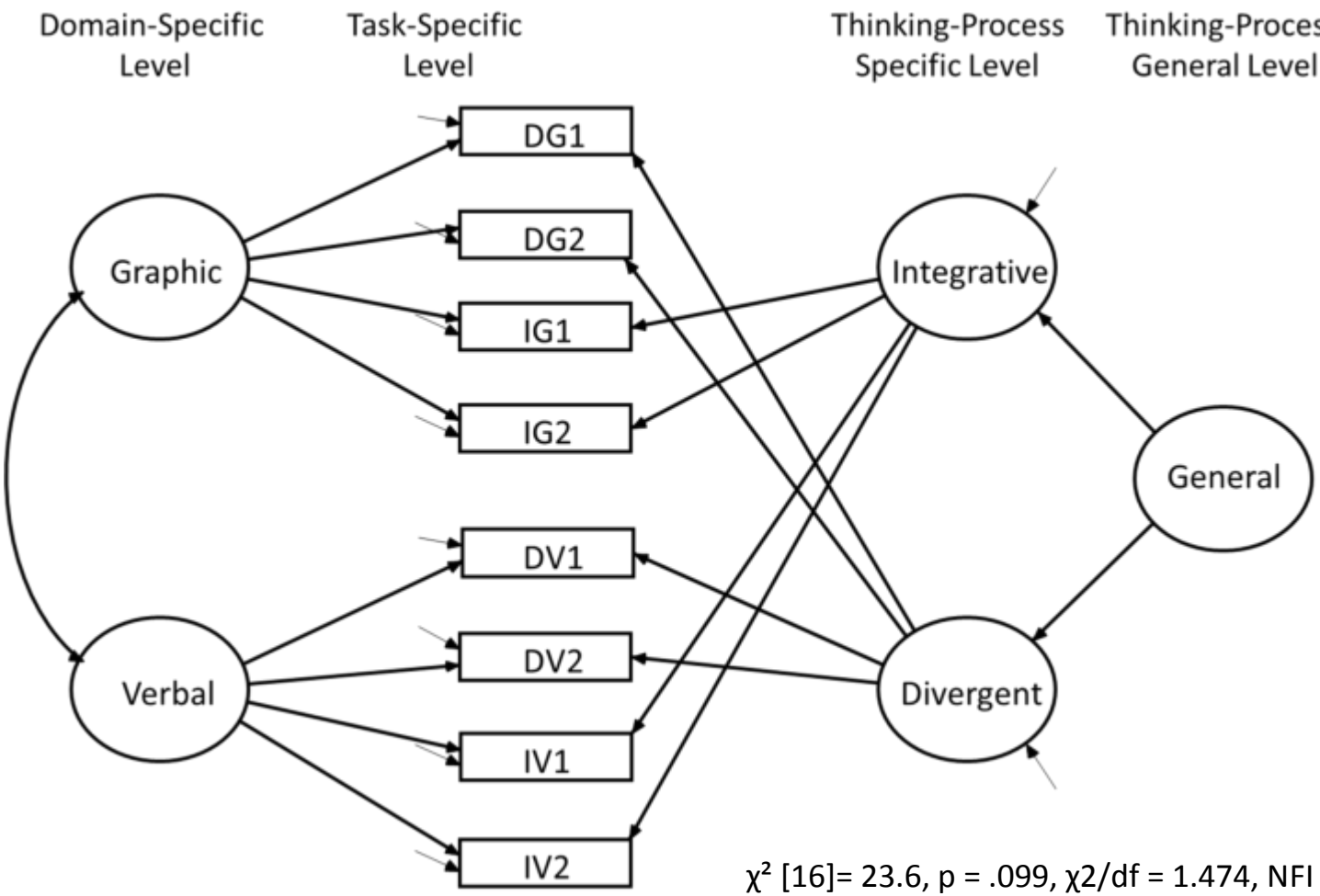
AGFI = .91 ; RMR =.021 ;
RMSEA = .079

EPoC : **E**valuation of **Po**tential for **C**reativity (Lubart, Besançon & Barbot, 2011)

Typical "multivariate profiles"

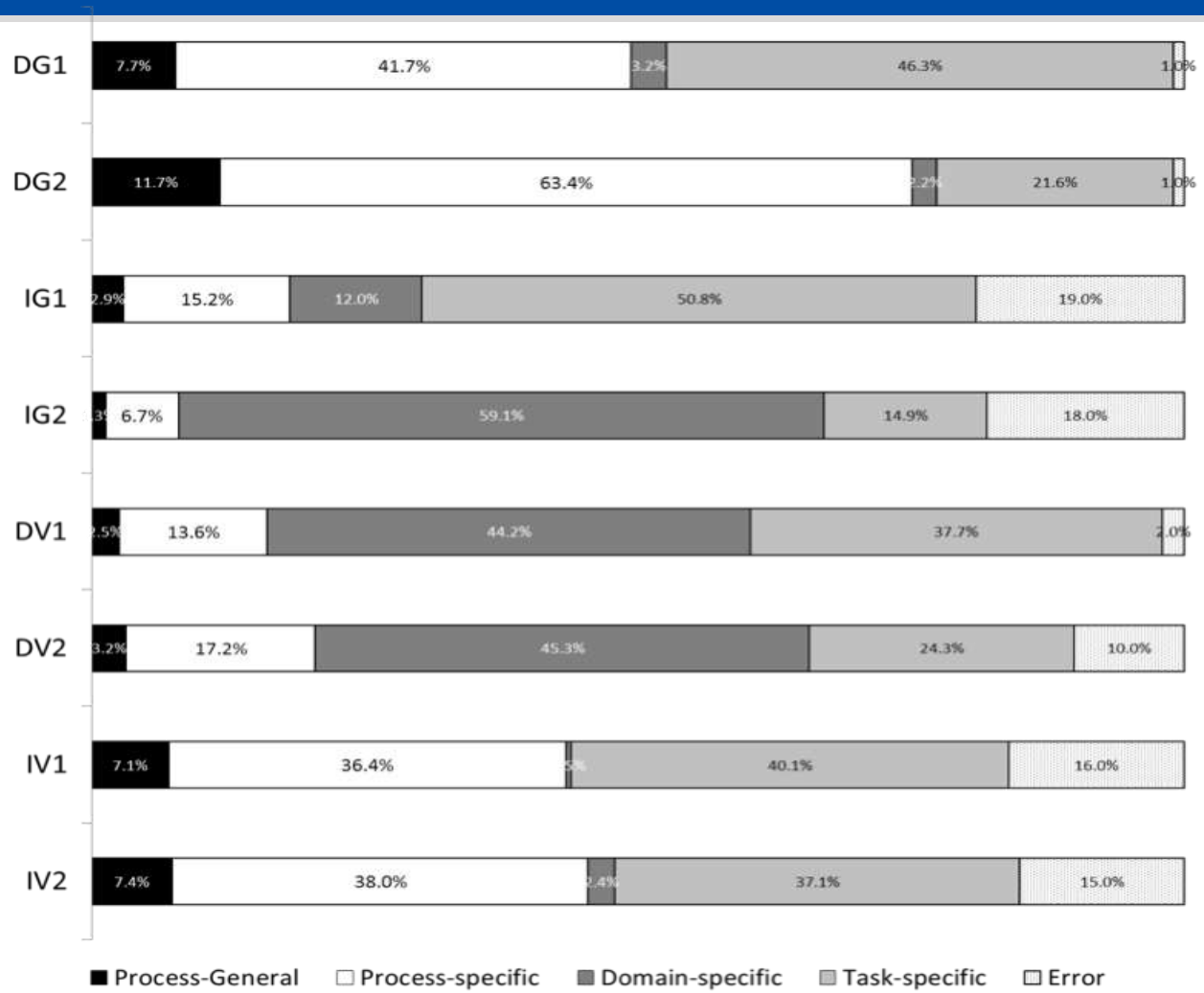


Domain Generality-Specificity issue



χ^2 [16]= 23.6, p = .099, $\chi 2/df$ = 1.474, NFI = .973, CFI = .991, RMSEA [90%-CI] = .031 [.000 - .057])

Domain Generality-Specificity issue



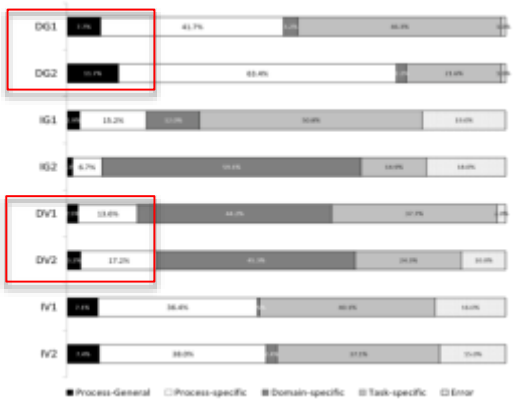
Estimates computed from residualized factors loadings after Schmit-leman Transformation

Domain Generality-Specificity issue

- The contribution of each component **greatly depends on the task under consideration**
- The contribution of a **general creative-thinking process factor** is overall **limited** (as it is represented in EPoC tasks), explaining no more than 12% of the variance in each task.
- Evidence for a **large amount of task-specificity variance** suggests that creative potential tasks demand more than general ability, thinking-process specific abilities, and domain-specific skills.

Domain Generality-Specificity issue

- DT tasks (especially verbal) may not be sufficient when used as a single indicator of “creative potential”,
- need to measure creative potential with comprehensive test batteries sampling a range of creative tasks, domains and thinking processes.



Domain Generality-Specificity issue

• Some studies provide also evidence for specificity within a specific domain of creative expression (e. g., Baer (1996) story or poem writing within the domain of literature)

• Runco (1986) : low correlation between Divergent thinking tasks

– Fluency .39 - .73

– Originality .46 - .78

– Flexibility . 37 - . 67

• Baer (1994a) : entrainement de la PD dans une tâche ne stimule pas la PD dans d'autres taches

Parallélisme des tâches de pensée divergente

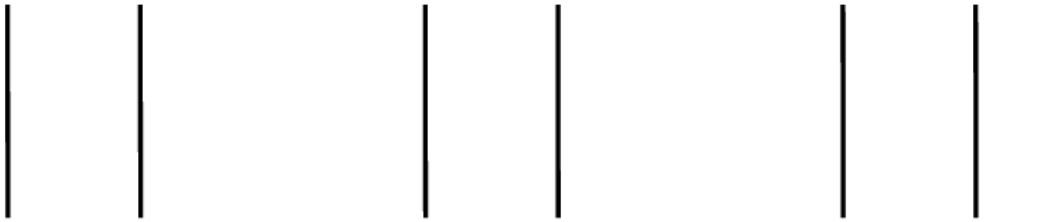
Etude Pilote: Parallélisme de 4 tâches
(Treinen & Barbot, 2007)

Subjects
125 adolescents (90 girls, 35 boys)
Between 16-18 years (mean age 16.28)

Material
4 divergent thinking tasks:
Parallel Lines
Incomplete Squares
Incomplete Circles
Incomplete Ovoid

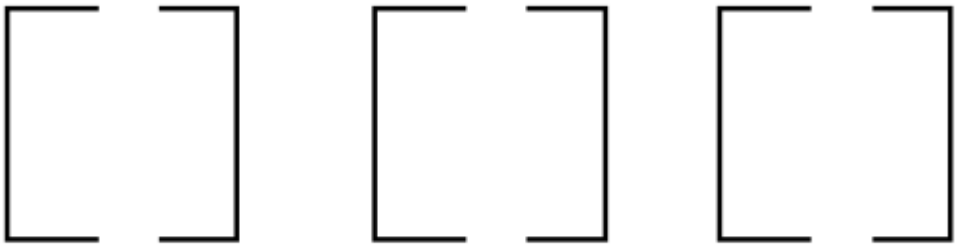
Etude Pilote: Parallélisme de 4 tâches
(Treinen & Barbot, 2007)

Parallel Lines



1._____ 2. _____ 3. _____

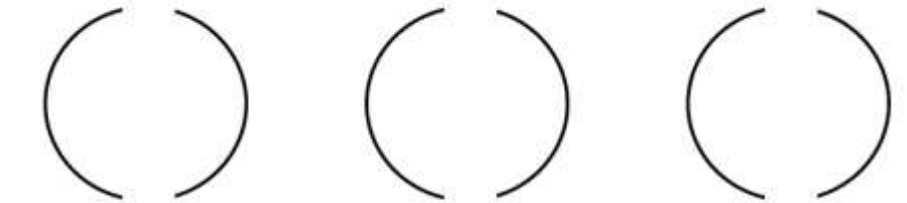
Squares



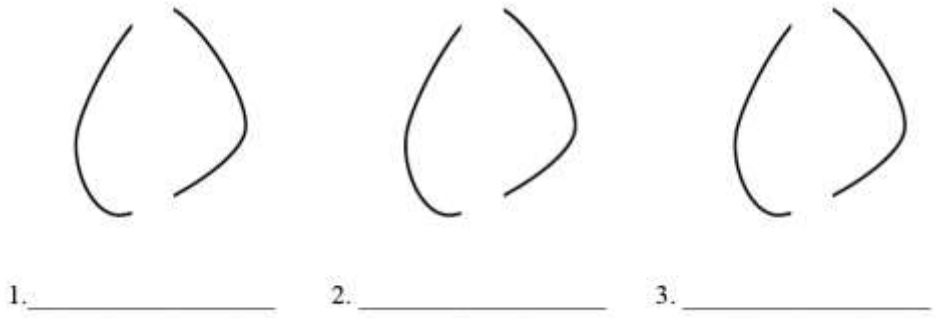
1._____ 2. _____ 3. _____

Etude Pilote: Parallélisme de 4 tâches
(Treinen & Barbot, 2007)

Circles



Ovoid



Etude Pilote: Parallélisme de 4 tâches
(Treinen & Barbot, 2007)

With interruption (8 weeks)

Group 1:
- Parallel Lines
- Circles
- Squares
- Ovoid

8 weeks

Group 3:
- Ovoid
- Squares
- Circles
- Parallel Lines

8 weeks

Without interruption

Group 2:
- Squares
- Ovoid
- Parallel Lines
- Circles

Group 4:
- Ovoid
- Squares
- Circles
- Lines

Etude Pilote: Parallélisme de 4 tâches (Treinen & Barbot, 2007)

No delay

	Fluency Lines	Fluency Squares	Fluency Circles	Fluency Ovoid
Fluency Lines	1	.76**	.83**	.70**
Fluency Squares	.76**	1	.71**	.82**
Fluency Circles	.83**	.71**	1	.77**
Fluency Ovoid	.70**	.82**	.77**	1

+8 weeks

	Fluency Lines+	Fluency Squares+	Fluency Circles+	Fluency Ovoid+
Fluency Lines	1	.48**	.55**	.39**
Fluency Squares	.48**	1	.52**	.62**
Fluency Circles	.55**	.52**	1	.48**
Fluency Ovoid	.39**	.62**	.48**	1

	M	SD
Lignes	10.94	5.06
Carrés	9.63	3.81
Ronds	12.03	5.51
Ovoid	10.49	4.36

Etude Pilote: Parallélisme de 4 tâches (Treinen & Barbot, 2007)

	No Delay		+8 weeks	
	Mean correlation	N	Mean correlation	N
Fluency	.76	59	.51	66
Flexibility	.66	59	.42	66
Originality: frequency of ideas	.76	59	.51	66
Originality: mean frequency	.15	59	.09	66

Quantitative aspect of divergent thinking (fluency) is a more general aptitude, whereas qualitative aspect (originality and flexibility) seems to be more specific to the stimulus used in the task

Mesure du « flux divergent »

Problème

- Les tâches classiques de pensée divergente se prêtent mal aux mesures répétées (effets de mémoire, carry-over effect)

- Il est difficile de formuler des tâches strictement parallèles (effets de stimuli) pour des traitements longitudinaux

- Les tâches classiques ne rendent pas compte du processus de production des idées

Solution (?)

- Contrôler les effets de stimuli en les manipulant au sein de la même tâche

- Approche micro-développementale centrée sur la dynamique de production d'idées nouvelles (« flux divergent ») plutôt que fluidité

- Postulats:
  1. Le processus de pensée divergente est en jeu quel que soit le stimulus de base
  2. Dans les applications longitudinales, les effets de mémoire seront limités en raison de la diversité des stimuli utilisés
  3. Les indicateurs de processus de flux divergent devraient être plus stables (fidèles) que les indicateurs classiques de fluidité

Design de la tâche

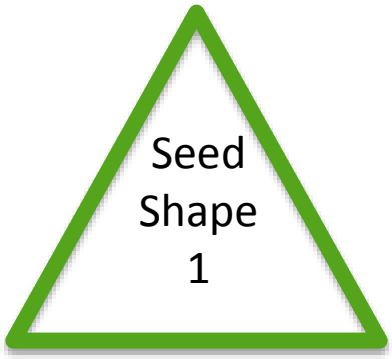
- Création de 18 stimuli qui doivent tous être complétés le plus rapidement possible (mais sans contrainte de temps)

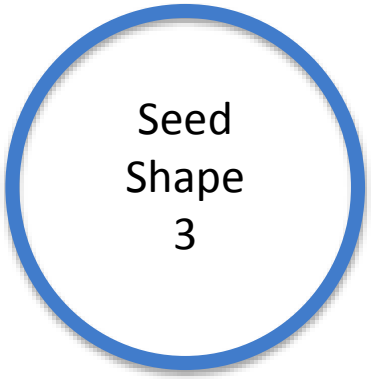
- La VD n'est plus le nombre d'idées produites mais le temps de complétion des 18 stimuli

- Implémentation sur tablette tactile pour mesurer les temps de production pour chaque idée.

Développement des stimuli

- 3 formes de base





- Chaque stimulus est une combinaison de 2 formes de base + un masque ouvert

- 3 pondérations de la surface de chaque forme de base (20%, 50%, 80 %)

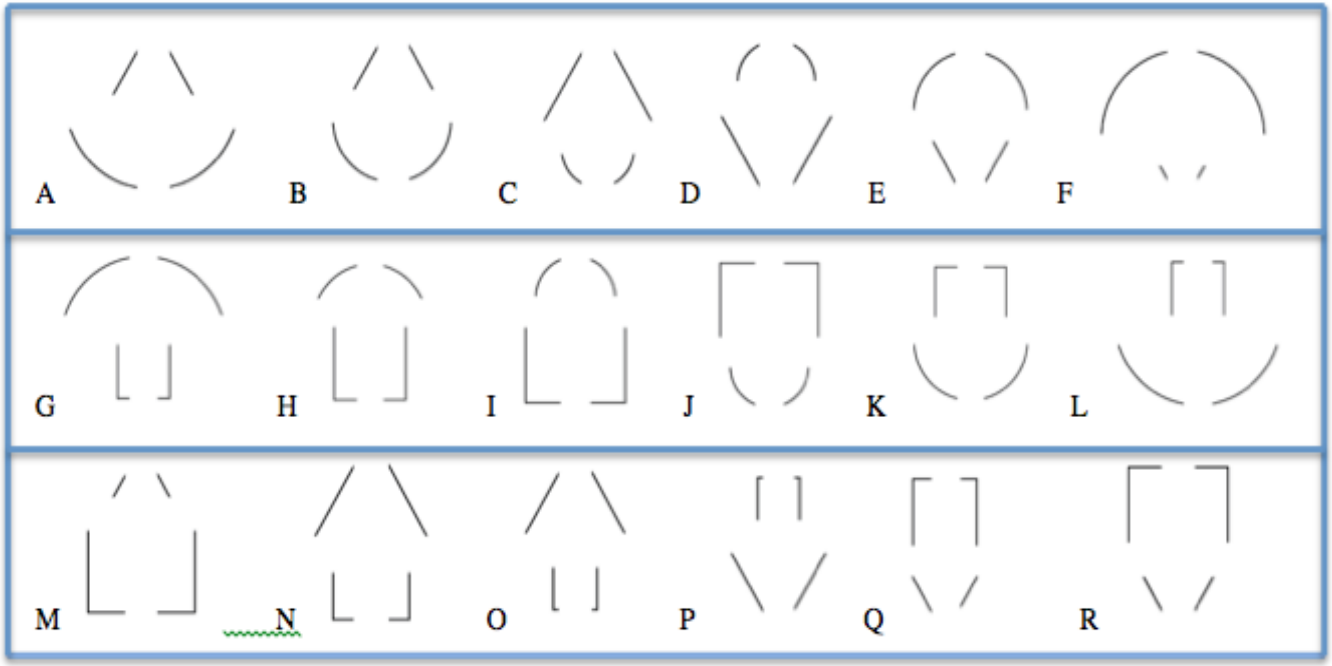
Développement des stimuli

New Stimulus

Apply Uniform Mask

New Stimulus With Boarders Open for Response

Développement des stimuli



A) 20% Triangle/80% Circle (8)
B) 50% Triangle/50% Circle (1)
C) 80% Triangle/20% Circle (11)
D) 20% Circle/80%Triangle (10)
E) 50% Circle/50% Triangle (14)
F) 80% Circle/20% Triangle (5)

G) 80% Circle /20% Square (4)
H) 50% Circle/ 50% Square (17)
I) 20% Circle/ 80% Square (9)
J) 80% Square/20% Circle (16)
K) 50% Circle/50% Square (13)
L) 20% Circle/80% Square (18)

M) 20% Triangle/80% Square (3)
N) 50% Triangle/50% Square (15)
O) 80% Triangle/20% Square (7)
P) 20% Square/80% Triangle (2)
Q) 50% Square/50% Triangle (12)
R) 80% Square/20% Triangle (6)

Etude Pilote: Mesure du « flux divergent » (Blanchard & Barbot, 2015)

- *N* = 18
  - Convenience sample
- 2 DT tasks with 20 minute time limits
  - Reproductive – a given domain
  - Generative – no given domain
- Distributed as paper booklets
- 18 stimuli each
  - Order shuffled for each task
  - Responses manually time stamped by participant as they completed each stimulus

Exemple de réponses : Sujet JH

1) 50% T + 50% C

2) 20% S + 80% T

3) 20% T + 80% S

4) 80% C + 20% S

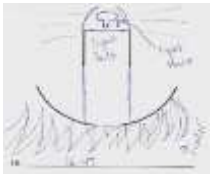
5) 80% C + 20% T

6) 80% S + 20% T

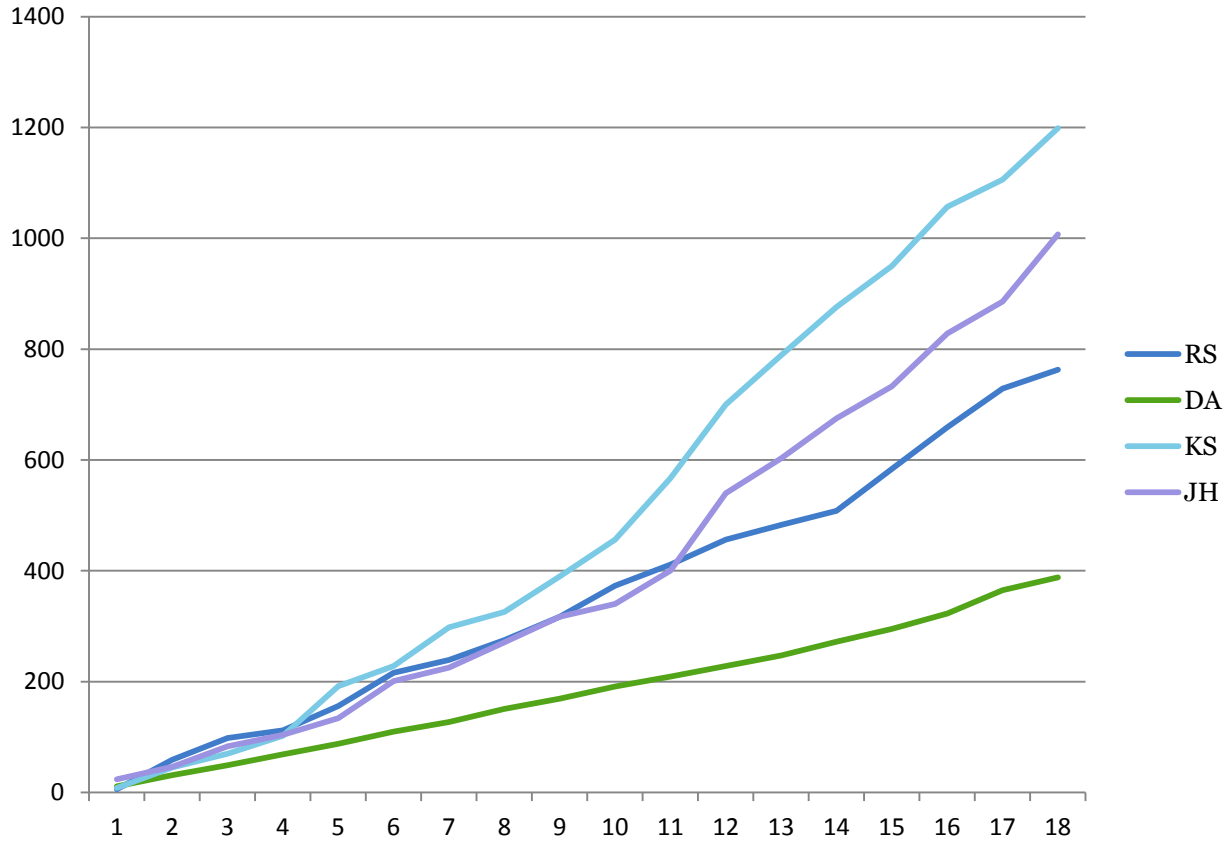
...

17) 50% C + 50% S

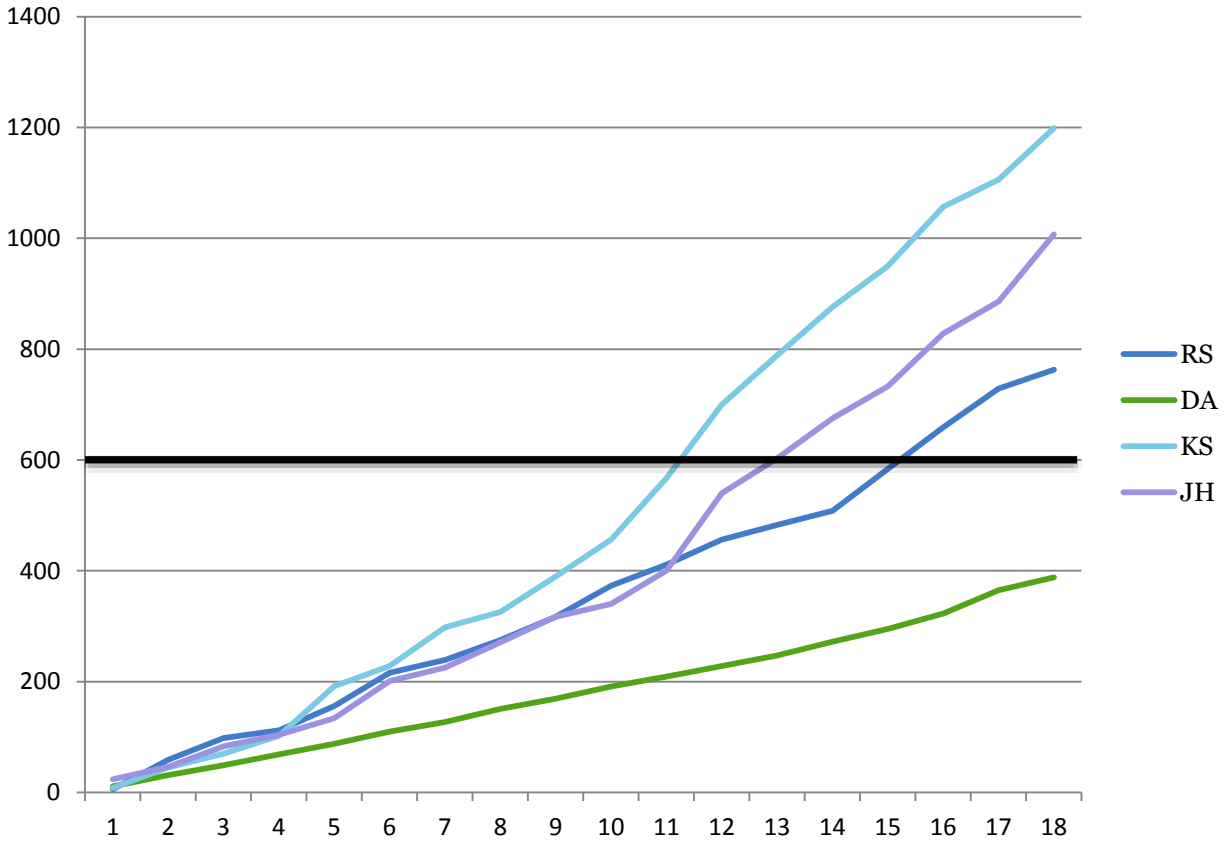
18) 20% S + 80% C



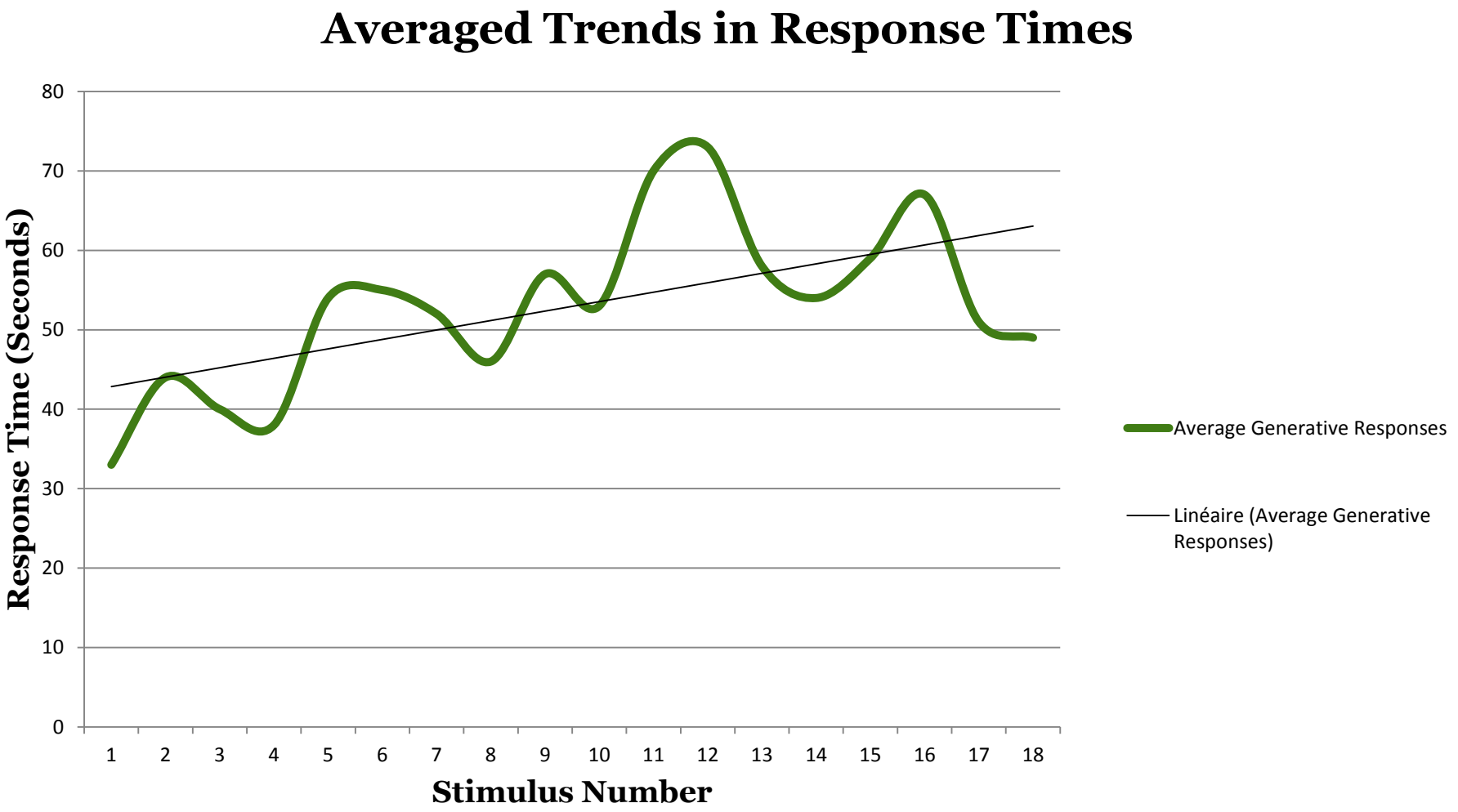
Résultats: exemple de courbes de réponses (additif)



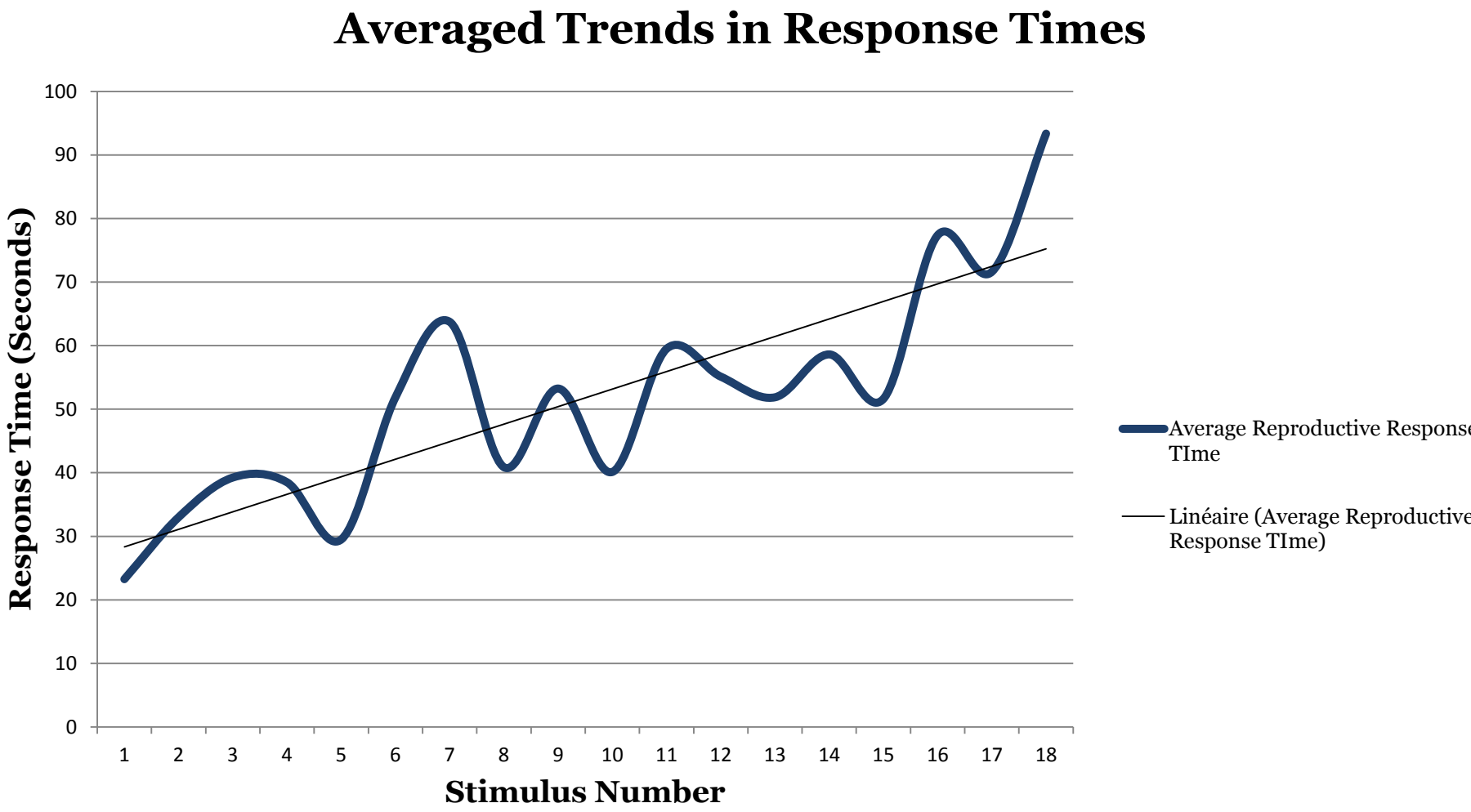
Résultats: exemple de courbes de réponses (additif)



Résultats: temps de production d'idées pour chaque stimulus



Résultats: temps de production d'idées pour chaque stimulus



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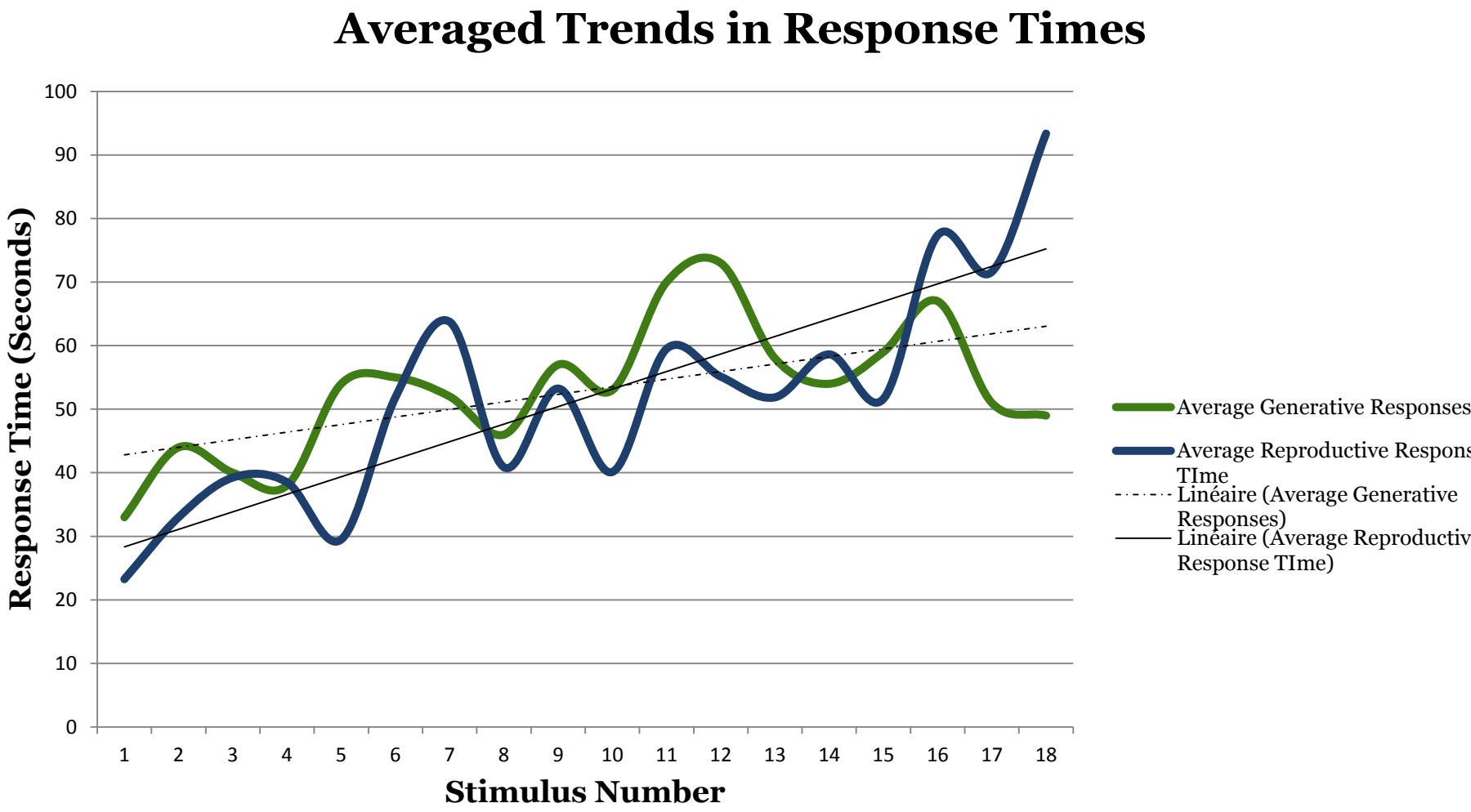

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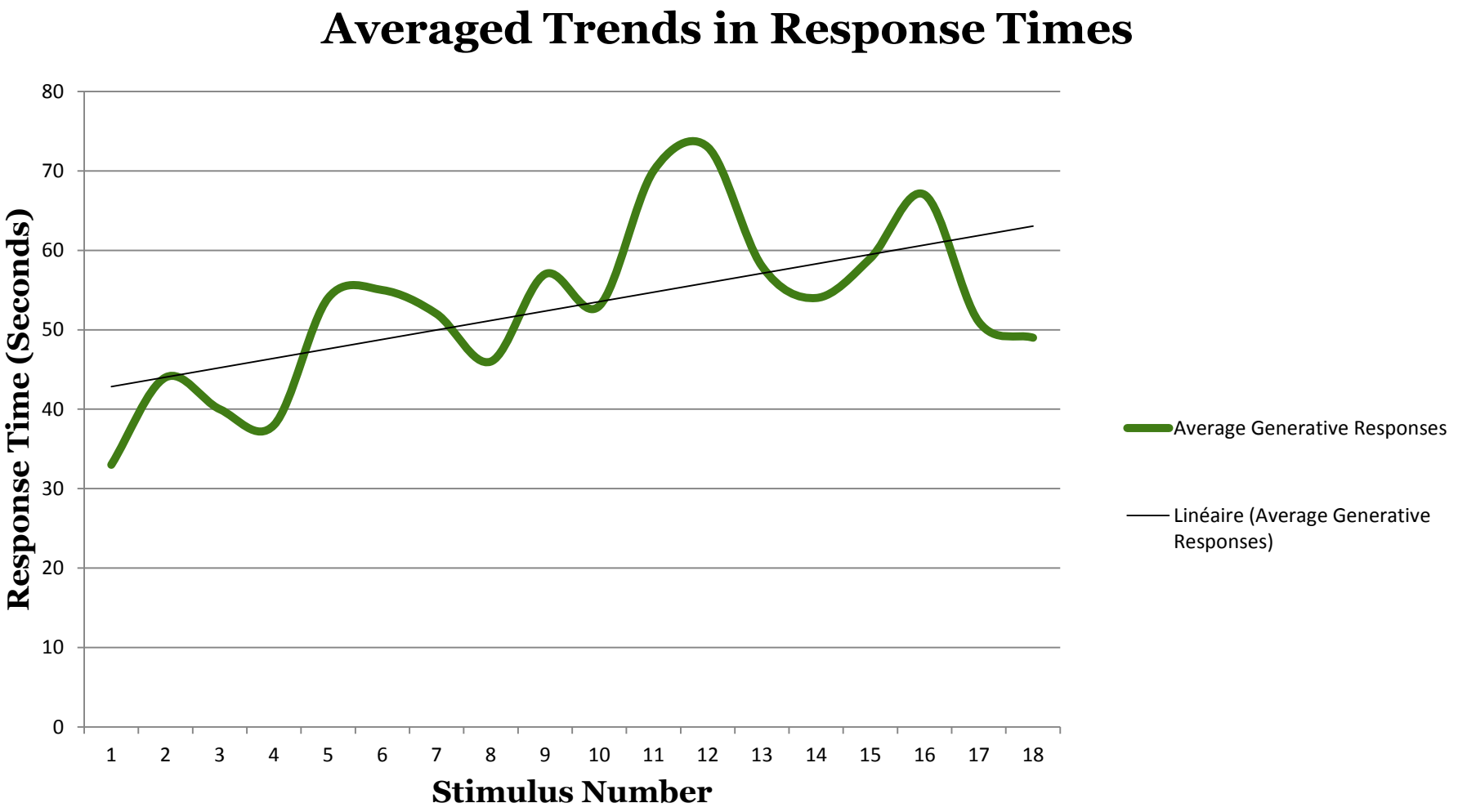
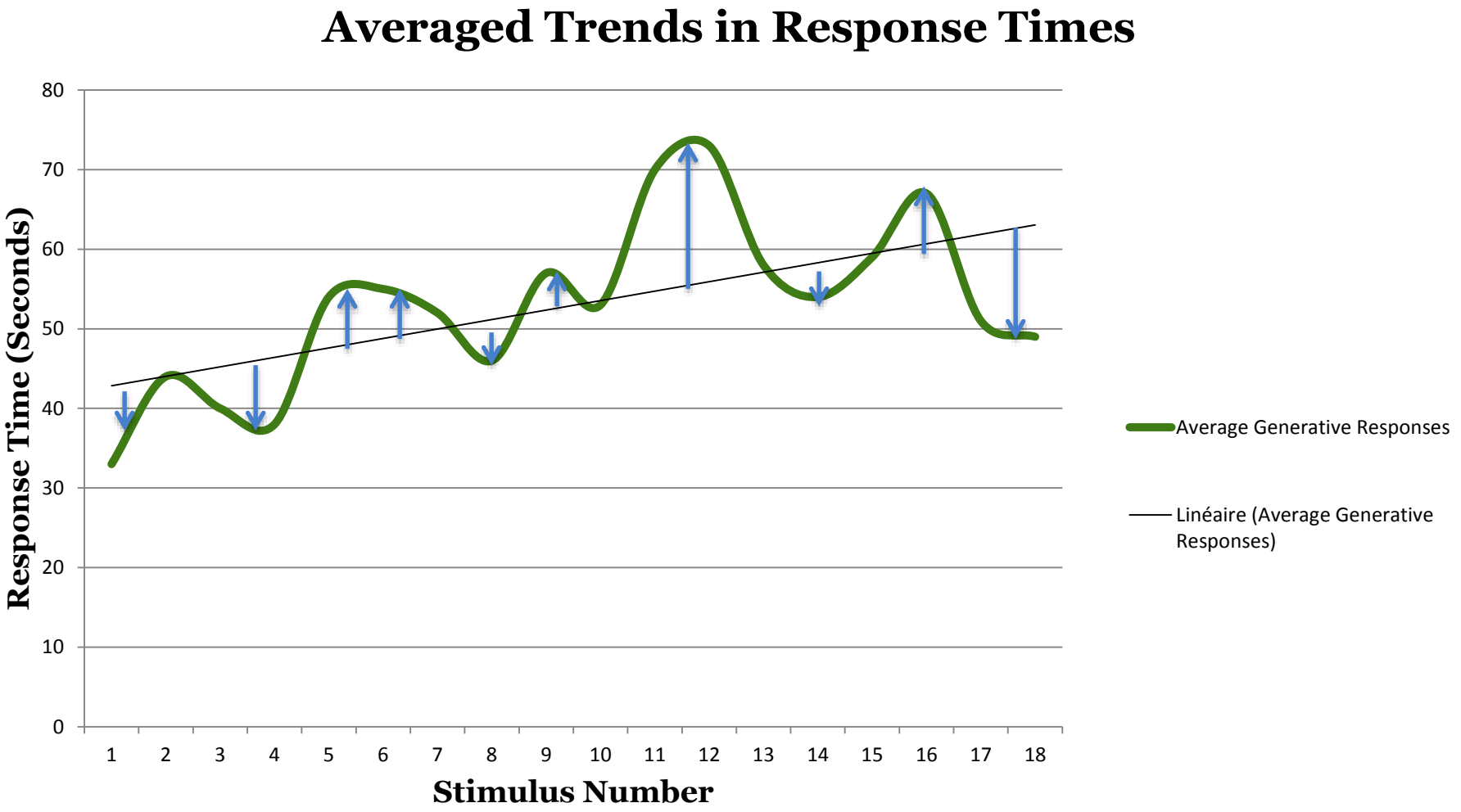


Résultats: temps de production d'idées pour chaque stimulus



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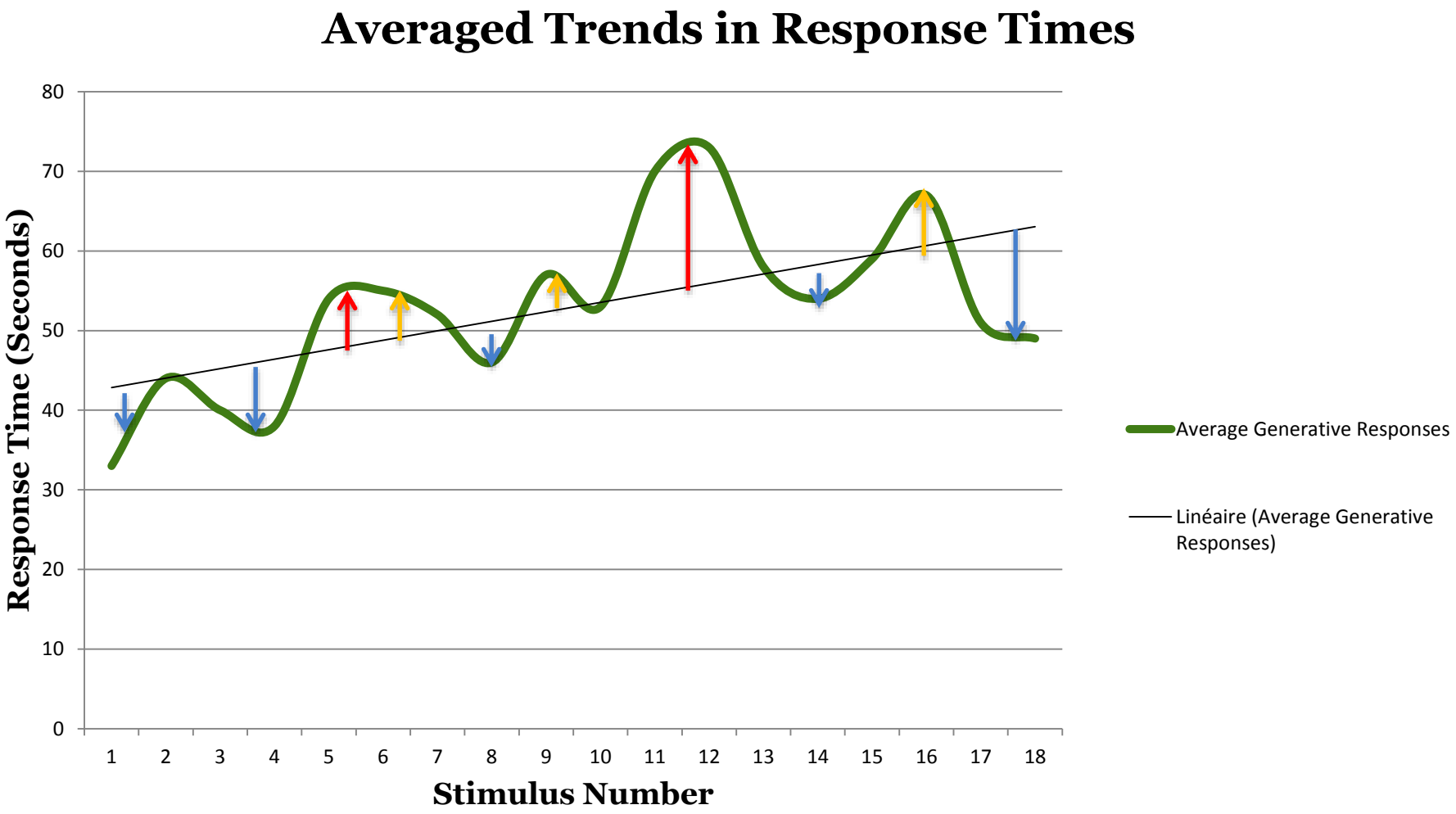
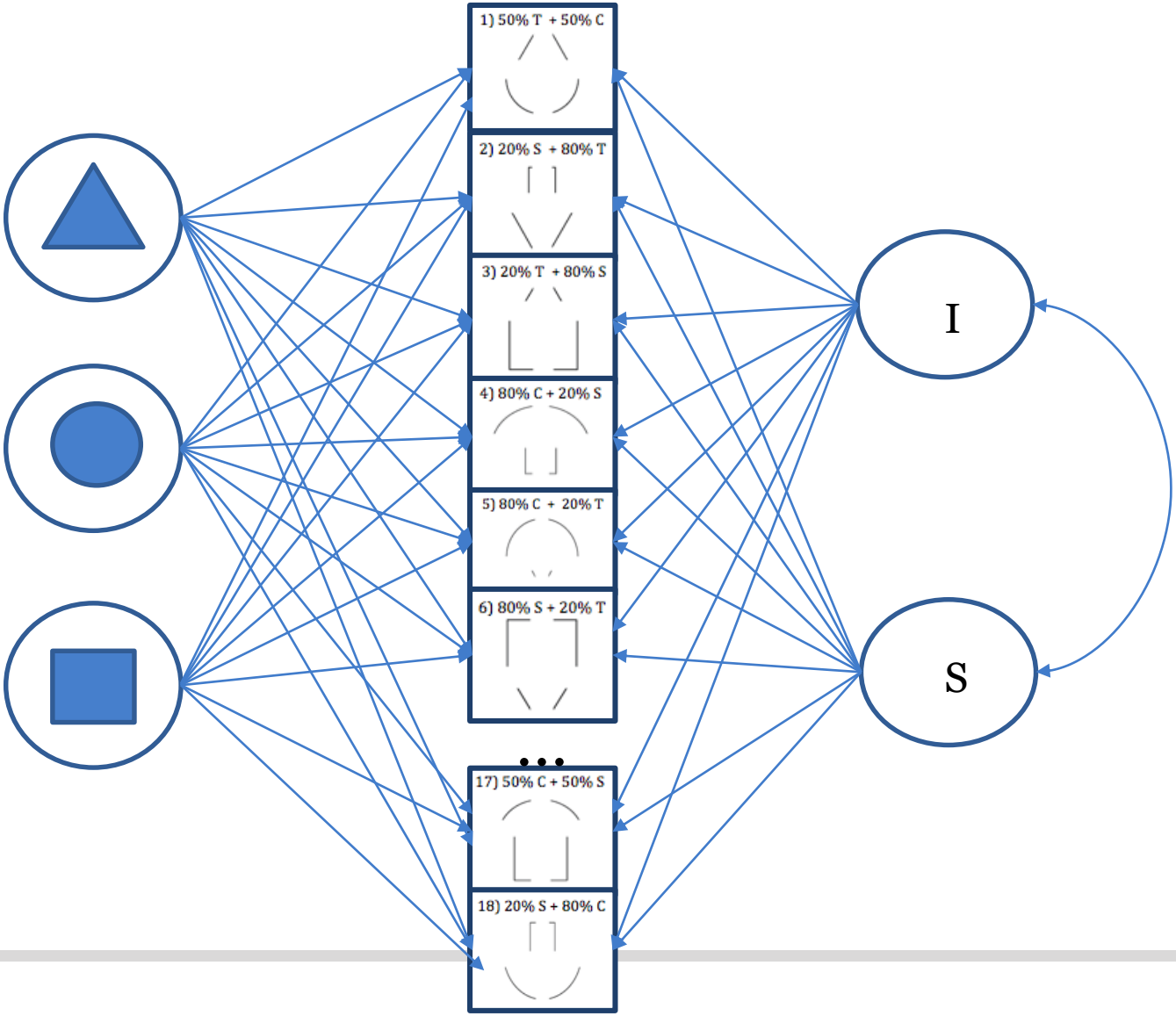


Modèle de mesure candidat



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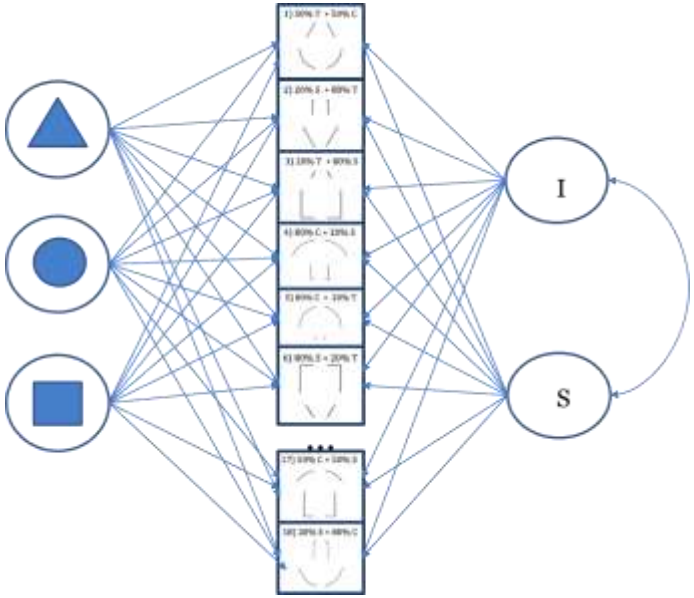


I = performance de « base »

S = flux de production

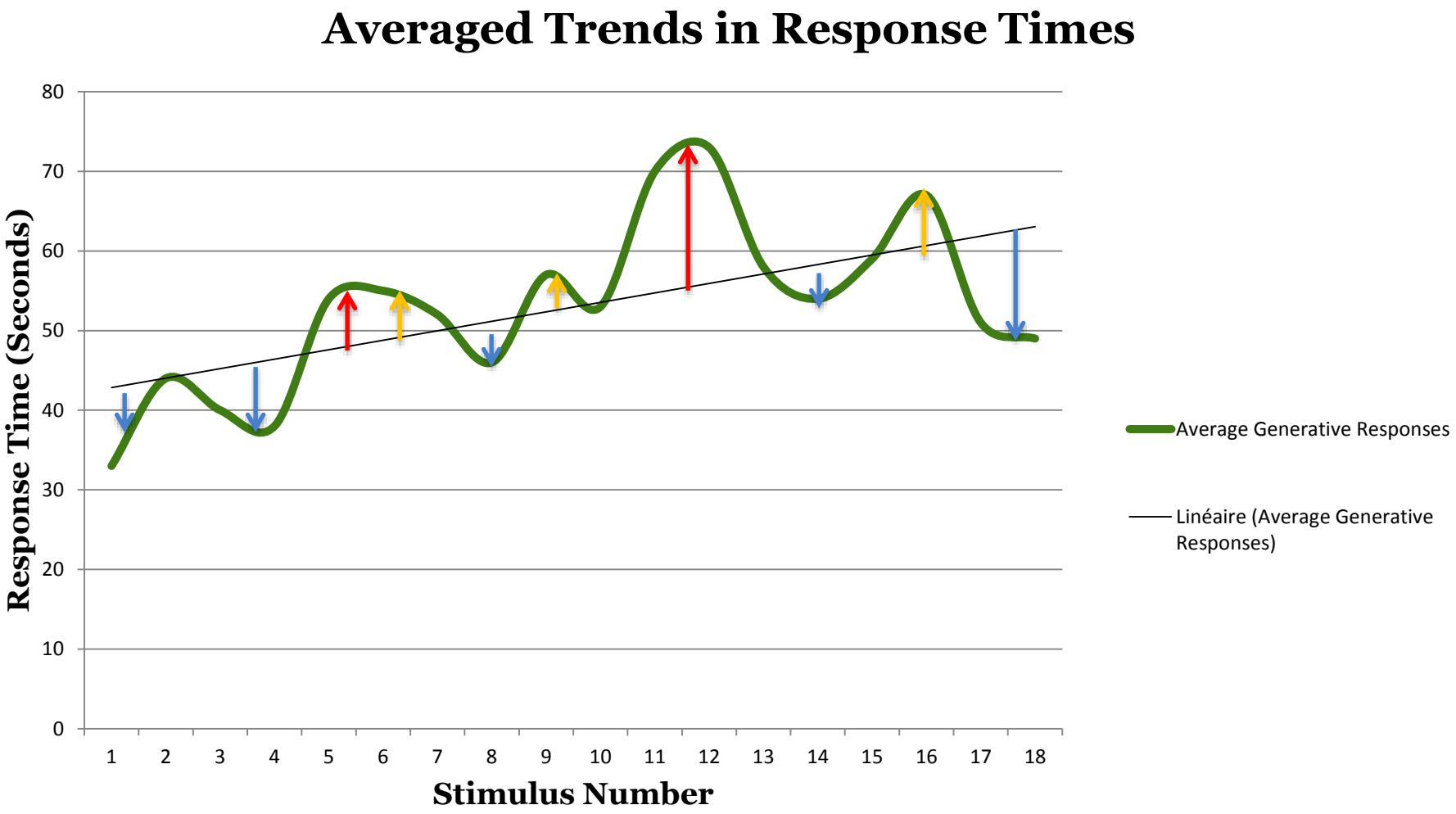
3T = sensibilité aux effets de stimuli

Forme fonctionnelle du changement identique pour tous?

Poids des facteurs perceptuels alignés avec la surface qu'ils occupent dans chaque stimulus?

Autres pistes?

Résultats: temps de production d'idées pour chaque stimulus



Questions

- Conceptuellement: toujours une mesure de pensée divergente?

- Méthodologiquement:
    1. Design de la tâche
    2. Modèle de mesure?
    3. Effets d'ordre?

Merci!

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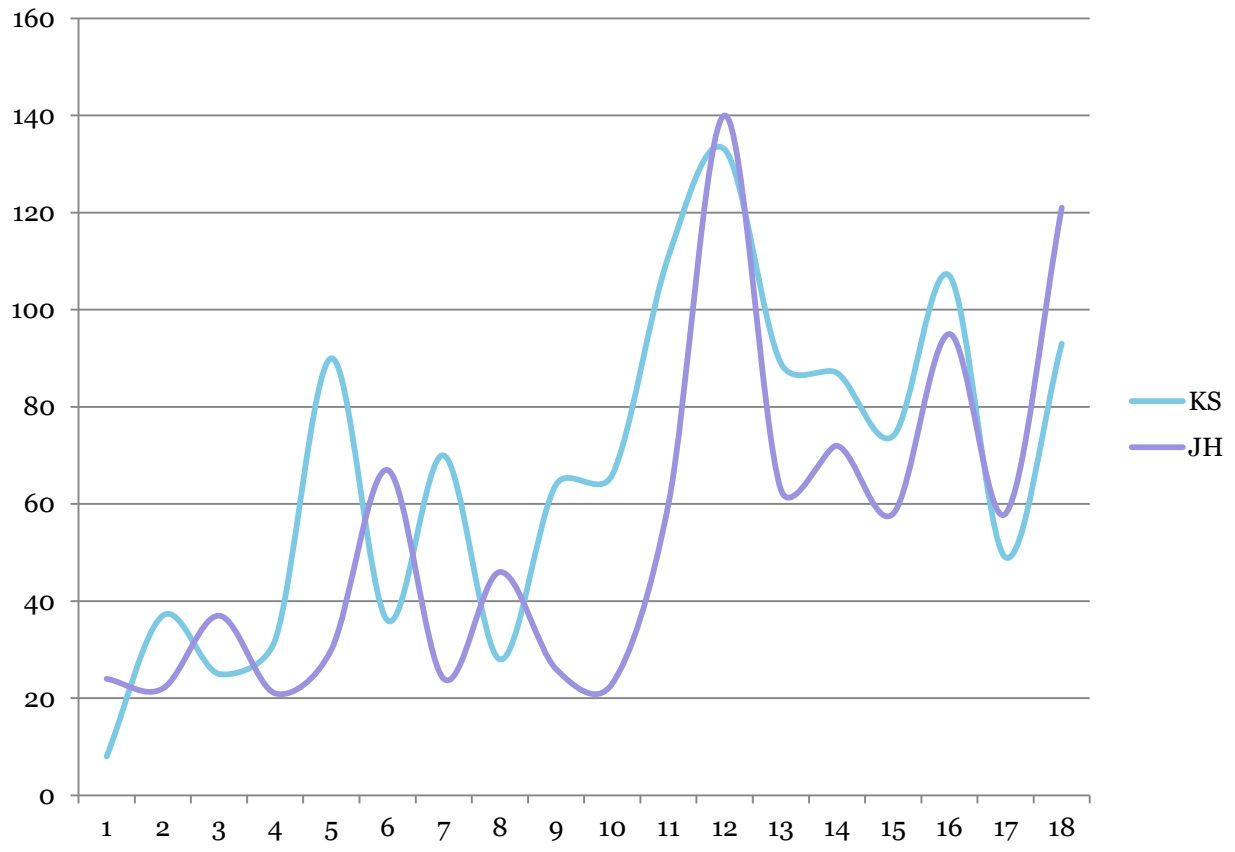
Résultats: temps de production d'idées pour chaque stimulus



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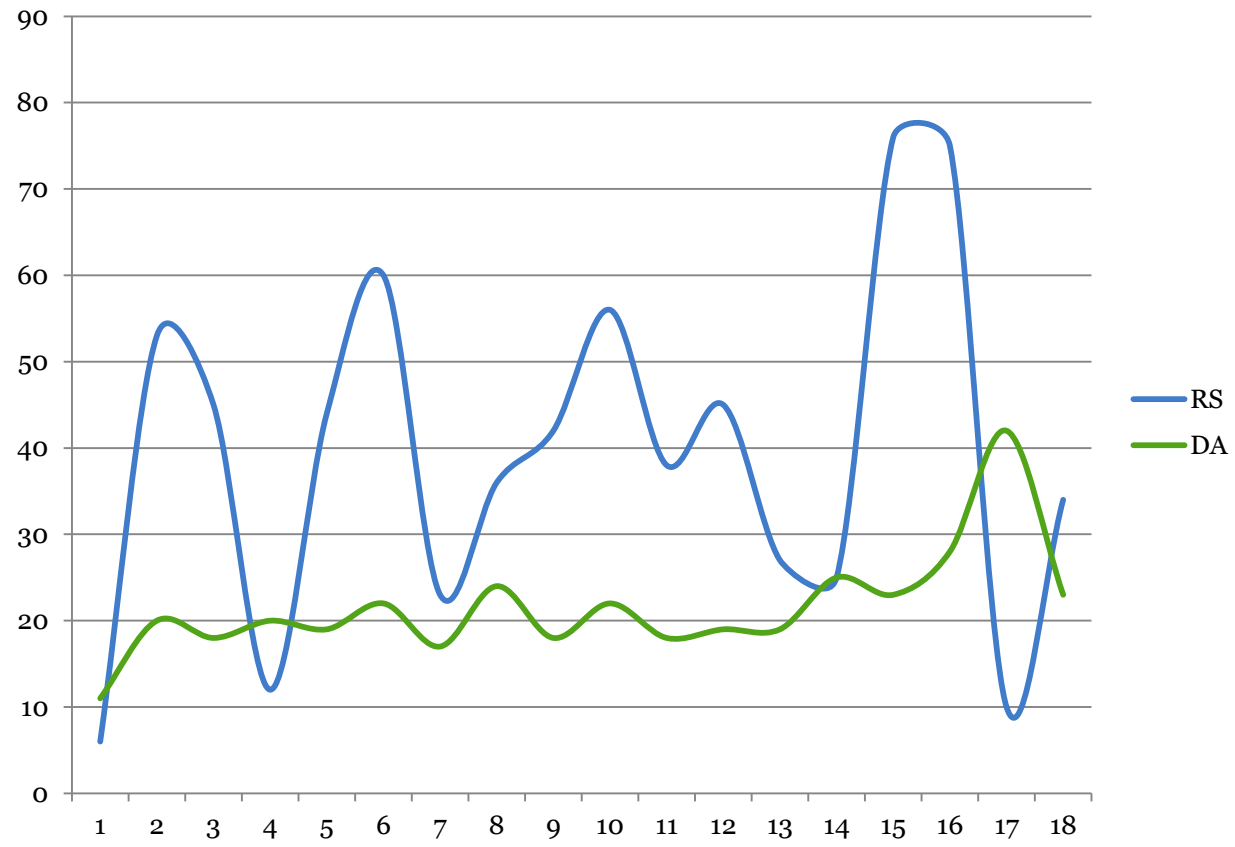

Results – Individual