L'ÉTUDE EXEPERIMENTALE EN CAS UNIQUE EN TCC, DE LA THÉORIE À LA PRATIQUE: ILLUSTRATION AU TRAVERS L'INSOMNIE CHRONIQUE

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51ème CONGRES AF TCC

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Conflit d'intérêt

- **Aucun**

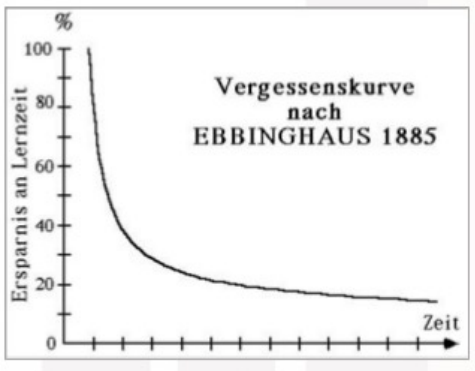

CLINICAL EXPERIENCE
RESEARCH EVIDENCE
PATIENT PREFERENCE
EVIDENCE
BASED
PRACTICE

A partir de quelle(s) variable(s) évaluez-vous l'efficacité de vos interventions ?

Avec quelle méthodologie évaluez-vous l'efficacité de ses interventions ?

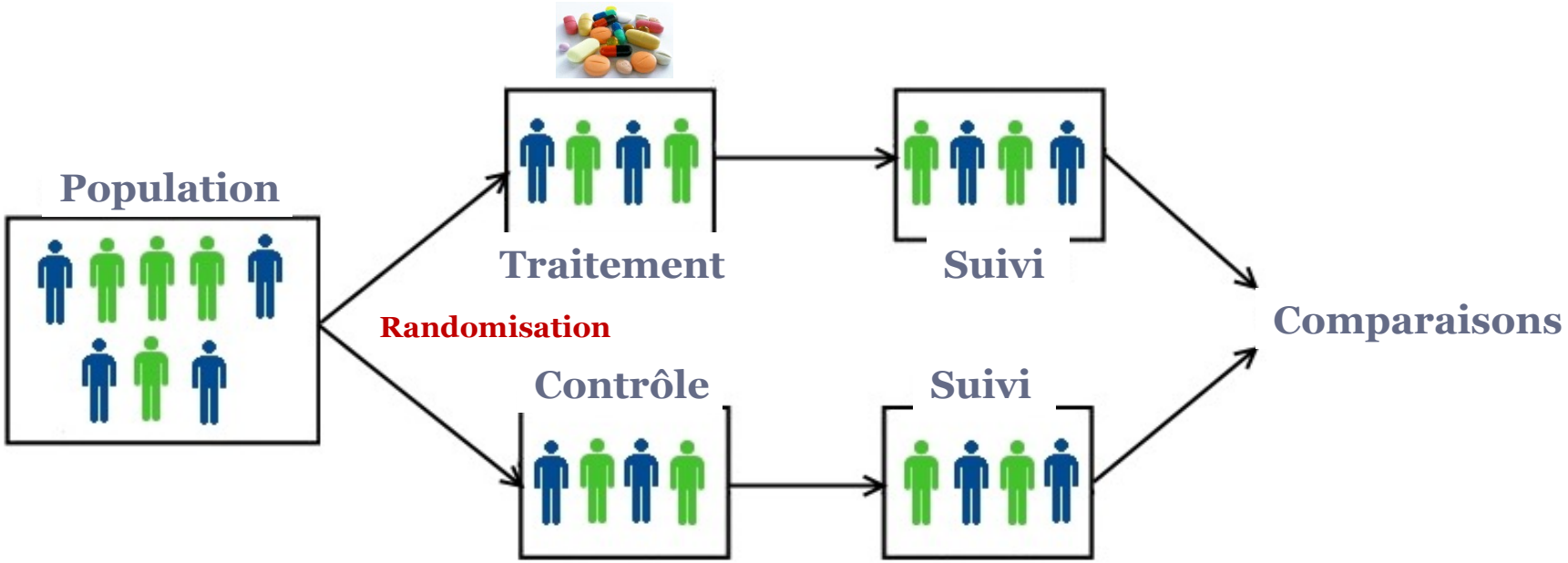
Introduction

- **Histoire: Le cas unique**
  - **Harlow (1848) - Ebbinghaus(1885/1913) – Milner (1957)**



Introduction

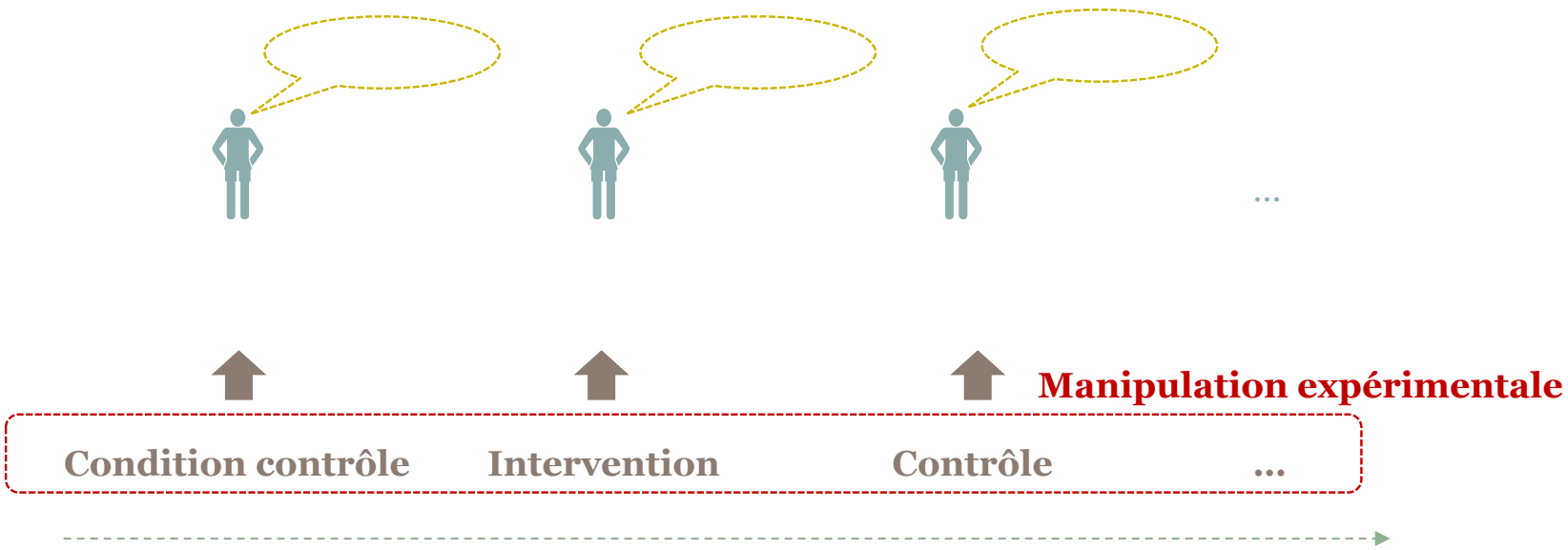
- **Hégémonie du groupe**



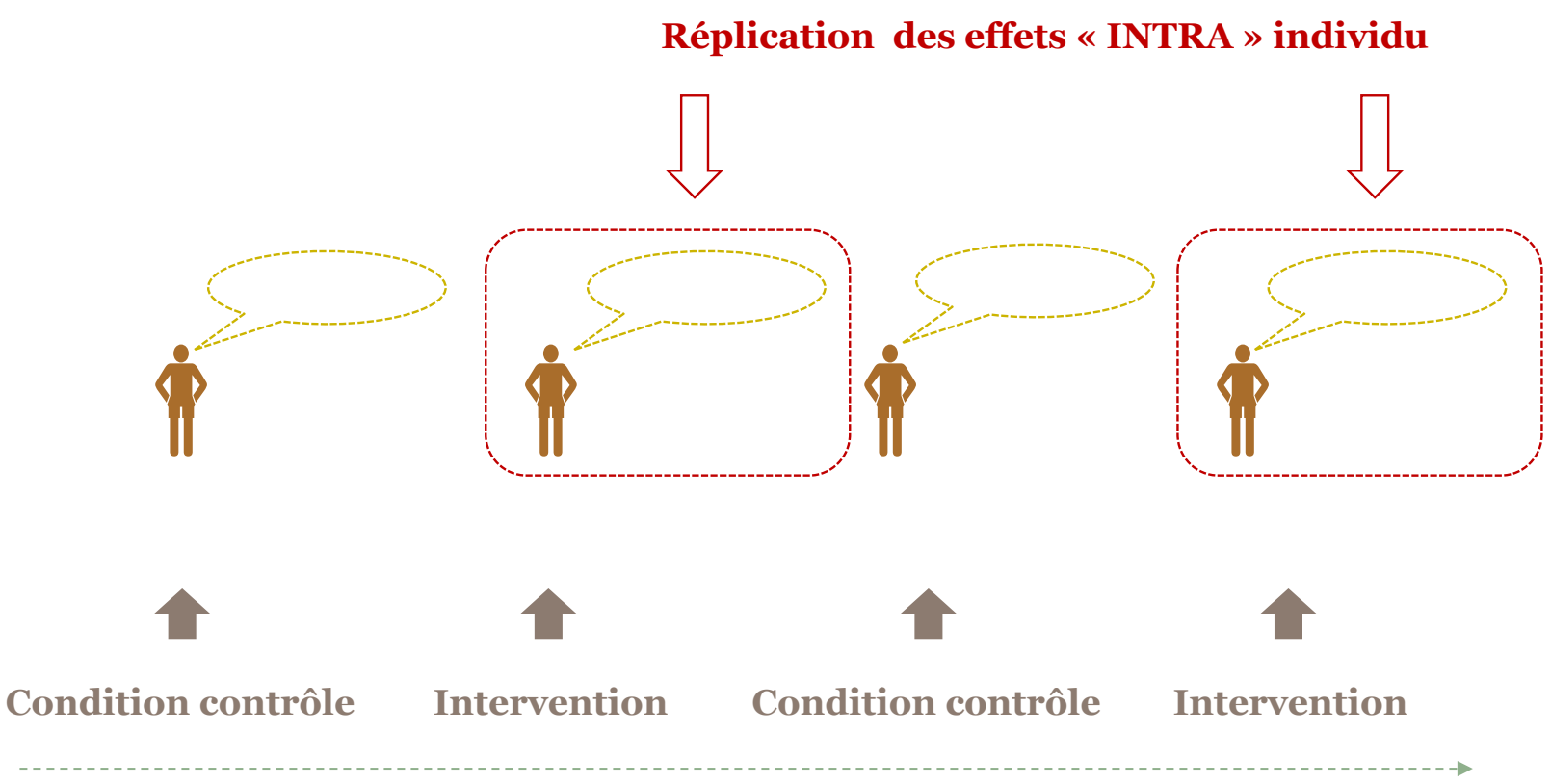
  - **Confiance excessive**
  - **Rythme lent**
  - **Quid des différences inter-individuelles**
  - **Coût**

Principes généraux

- ***Single case experimental designs* (*SCEDs*)= gamme de méthodes**
  - **L'individu (ou autres !) est son propre contrôle**
  - **Méthodes issues de l'étude de la cognition et du comportement**
  - ***Theory-neutral* applicables à tout type d'interventions**

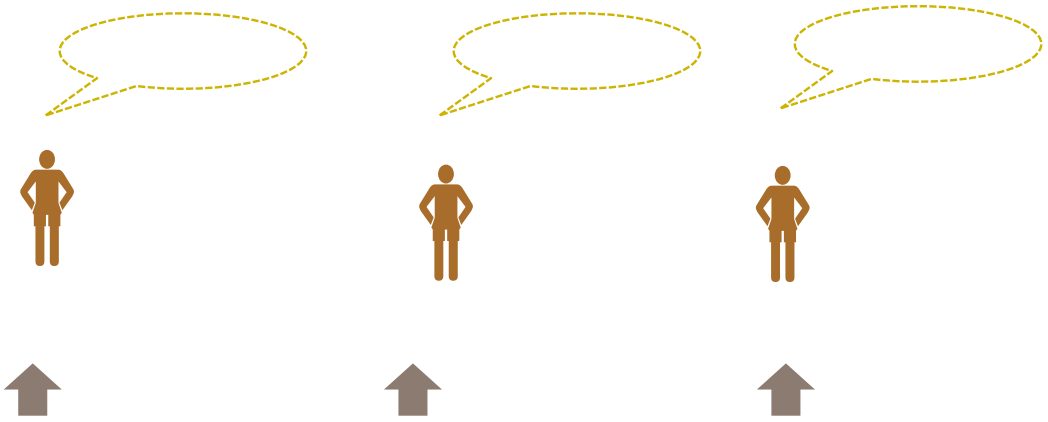


Principes généraux



Principes généraux

- **Variable(s) dépendante(s) *&* Variable(s) indépendante(s)**



Condition contrôle « Ligne de base » | **Intervention** | **Post-intervention**

Intérêts

- **Intérêts**
  - **(1) Démonstration d'une relation causale claire**
    - Etude sur larges échantillons: temps, argent, personnel
  - **(2) Flexibilité dans l'implémentation et l'évaluation des interventions**
    - Etude sur larges échantillons: prise en charge non-adaptable aux différences interindividuelles
  - **(3) Evaluation de patterns individuels de changement**
    - Etude sur larges échantillons: 1 pré & 1 post
  - **(4) Contourne les critiques méthodologiques statistiques des études sur groupes**
    - Coût, individualité, stationnarité

ABA et ABAB

Design	Procedure	Advantages	Disadvantages
Reversal (ABA, ABAB)	Baseline conducted, treatment is implemented, and then treatment is removed	Within-subject replication; clear demonstration of an intervention effect in one subject	Not applicable if behavior is irreversible, or when removing treatment is undesirable

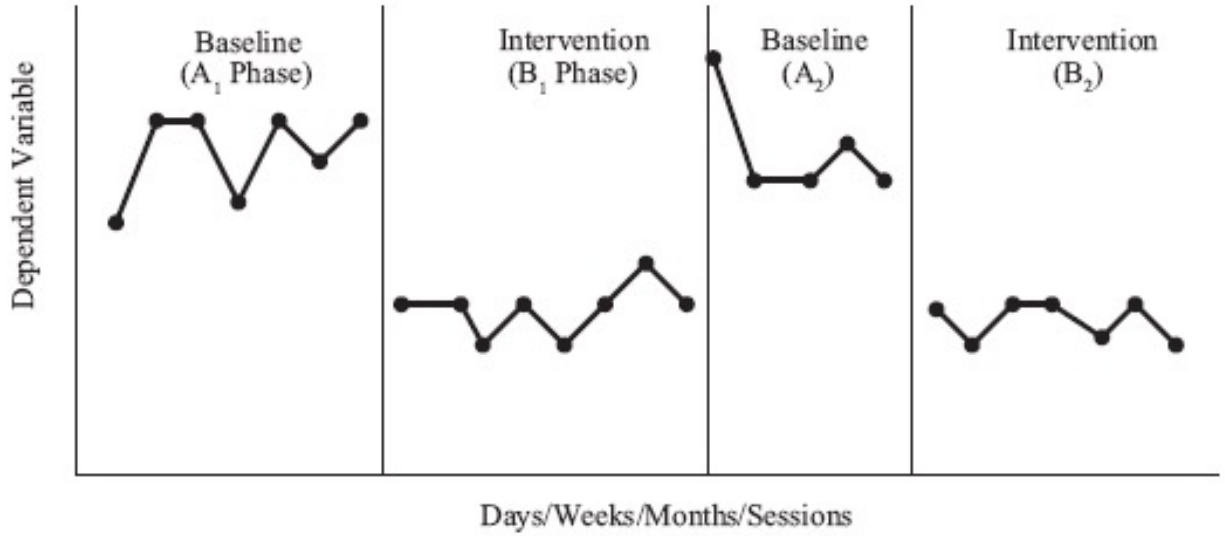
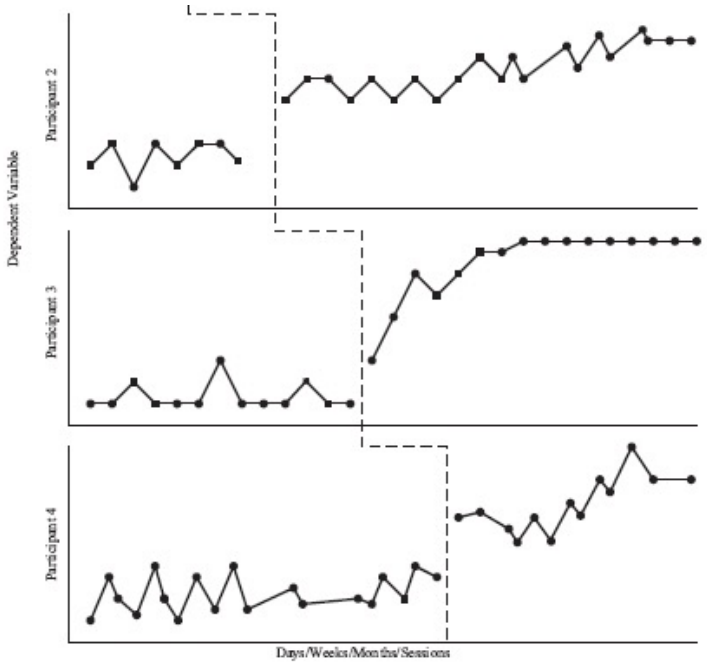


Figure 1. Hypothetical data for an ABAB design with one experimental unit.

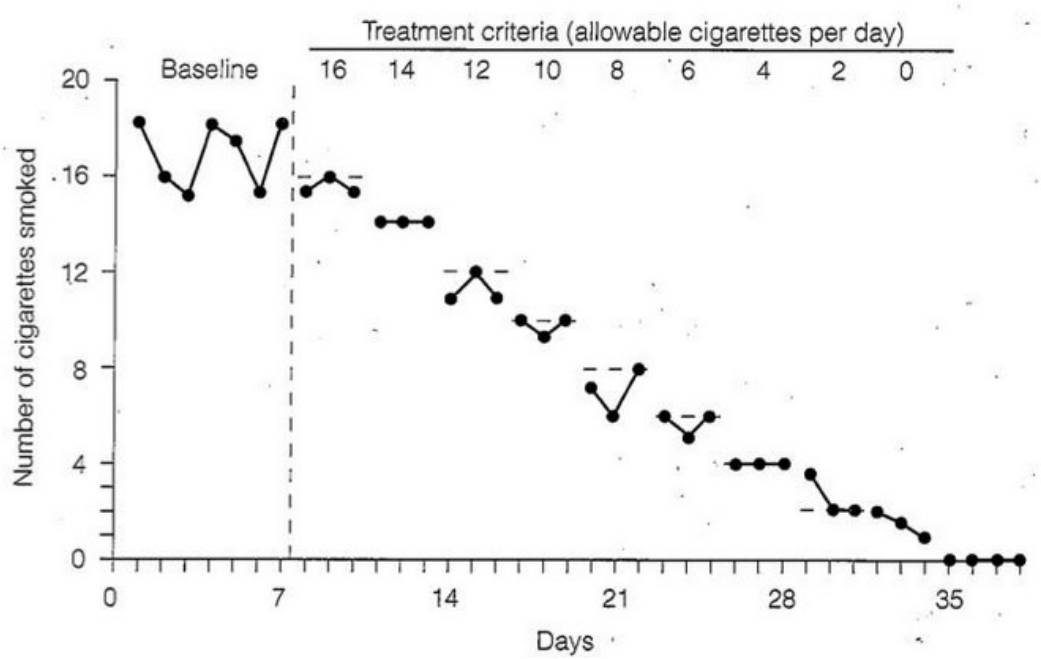
Protocole à lignes de base multiples

Design	Procedure	Advantages	Disadvantages
Multiple baseline (interrupted time series, stepped wedge)	Baseline is conducted for varying durations across participants, then treatment is introduced in a staggered fashion	Treatment does not have to be withdrawn	No within-subject replication. Potentially more subjects needed to demonstrate intervention effects than when using reversal design



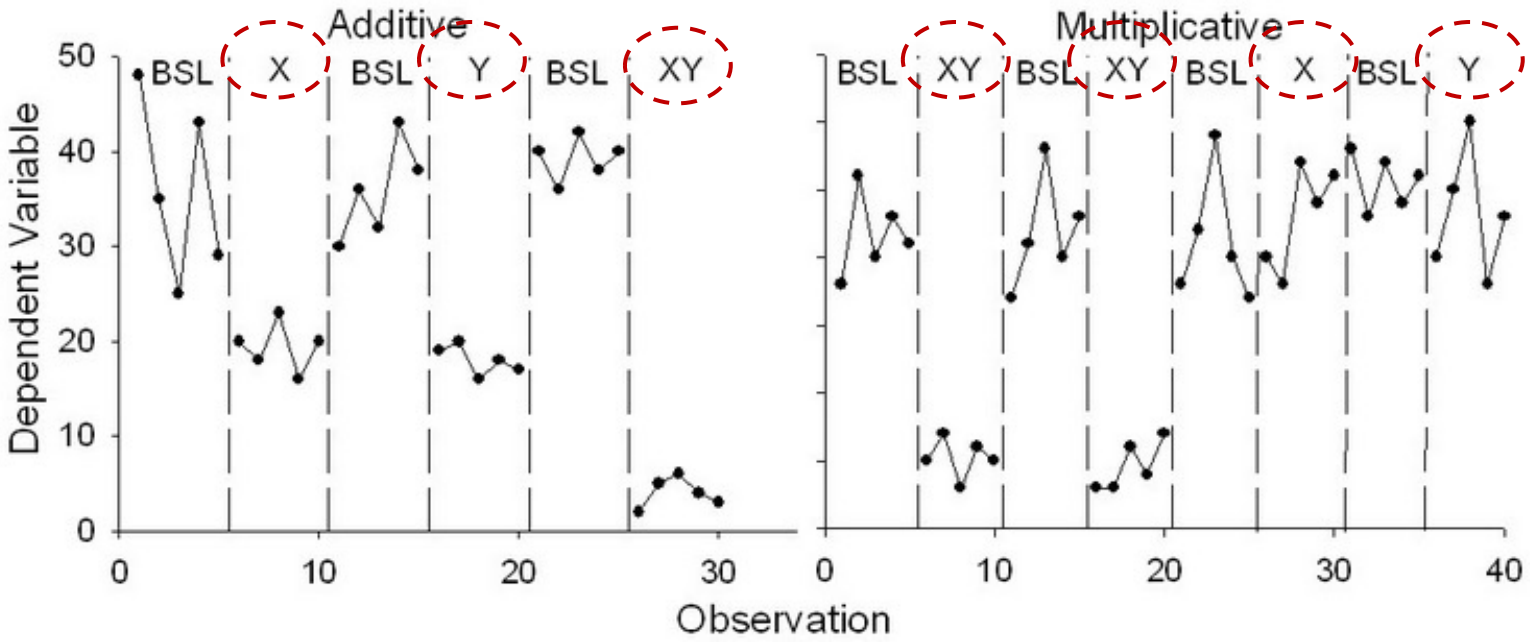
Changement du critère

Design	Procedure	Advantages	Disadvantages
Changing criterion	Following a baseline phase, treatment goals are implemented. Goals become progressively more challenging as they are met	Demonstrates within-subject control by levels of the independent variable without removing treatment; Useful when gradual change in behavior is desirable	Not applicable for binary outcome measures—must have continuous outcomes



Combiné

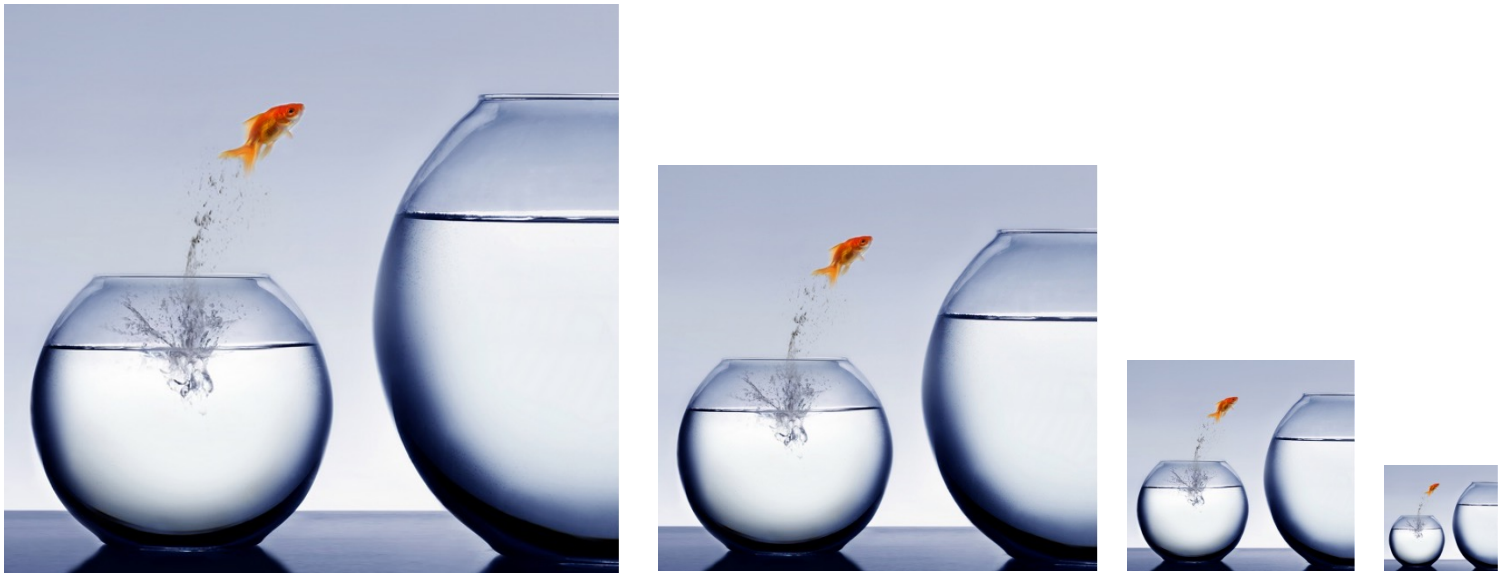
Design	Procedure	Advantages	Disadvantages
Combined	Elements of any treatment can be combined	Allows for more flexible, individually tailored designs	If different designs are used across participants in a single study, comparisons across subjects can be difficult



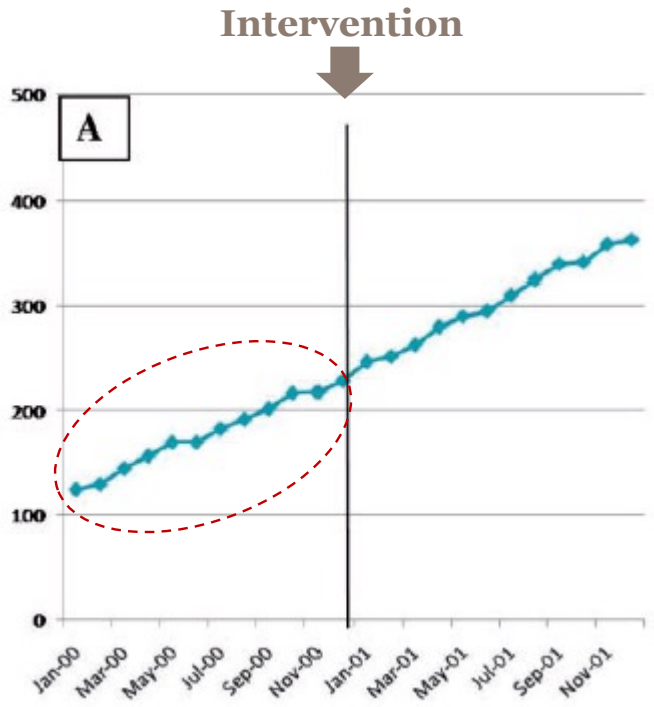
Données longitudinales – *les biais* !

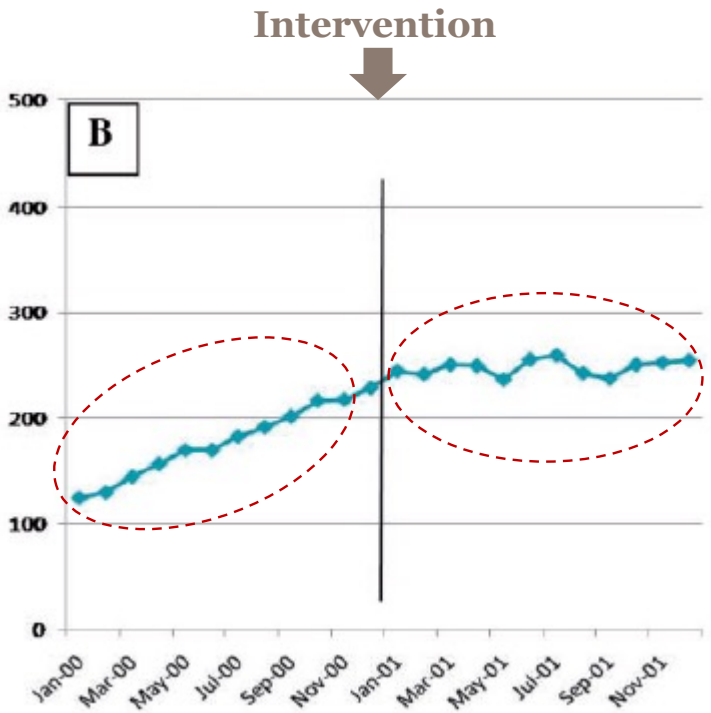
- **The *challenge…***
  - **Evaluation répétée du <u>même</u> comportement <u>au cours du temps</u>**

  ➔ ***Les données seront donc longitudinales***



Données longitudinales – *les biais* !



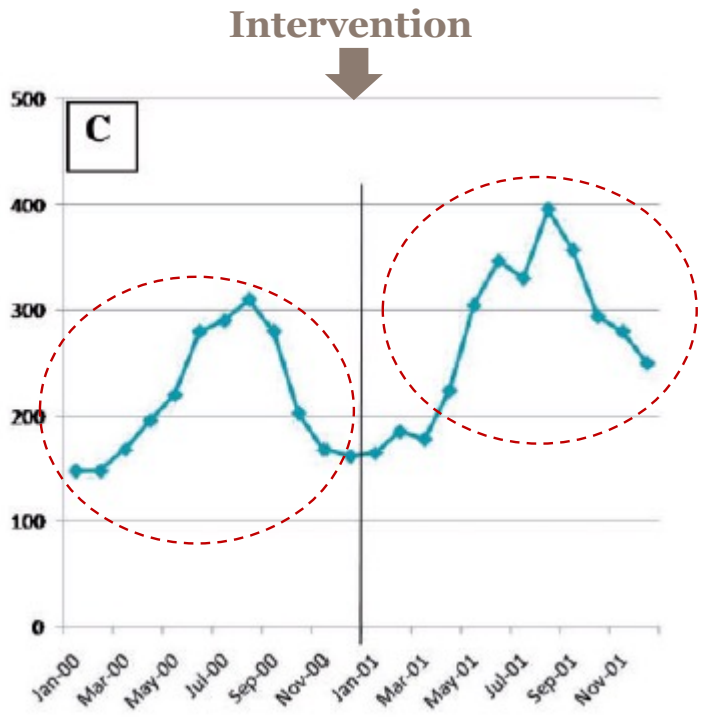


Données non-stationnaires

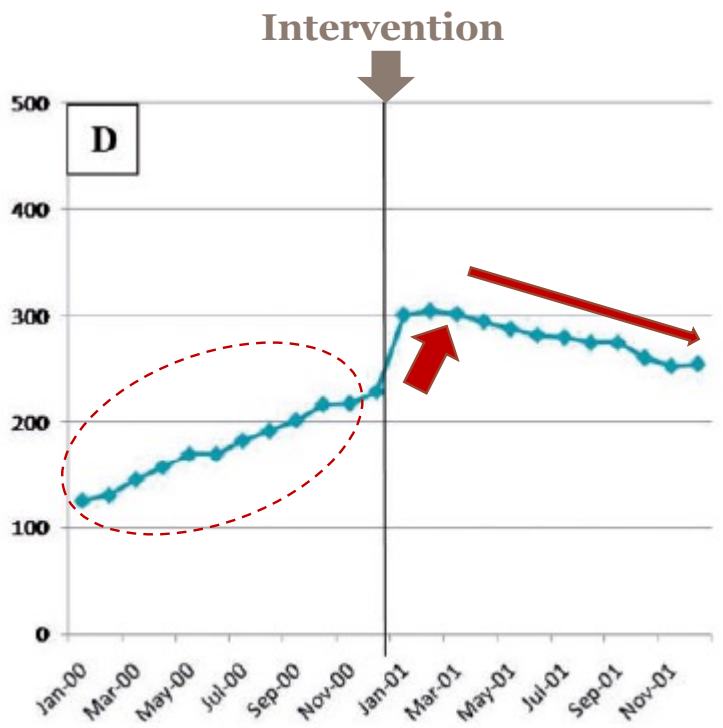
Données longitudinales – *les biais* !

- **(1) Absence de stationnarité:**
  - **Existence – indépendante d'autres évènements – de tendance(s) « naturelle(s) » (ex. ⇗ ou/et ⇘)**
- **(2) Autocorrélation:**
  - **Des valeurs à un point donné (*t*) *sont* statistiquement corrélées avec les données précédentes (*t*-1). Typiquement, des points adjacents de données sont plus susceptibles d'être corrélés entre eux comparativement à des points plus éloignés dans le temps**
- **(3) Saisonnalité:**
  - **Il peut exister des changements (attendus) réguliers dans les données secondaires à des effets saisonniers (ex. ?)**

Données longitudinales – *les biais* !



Saisonnalité



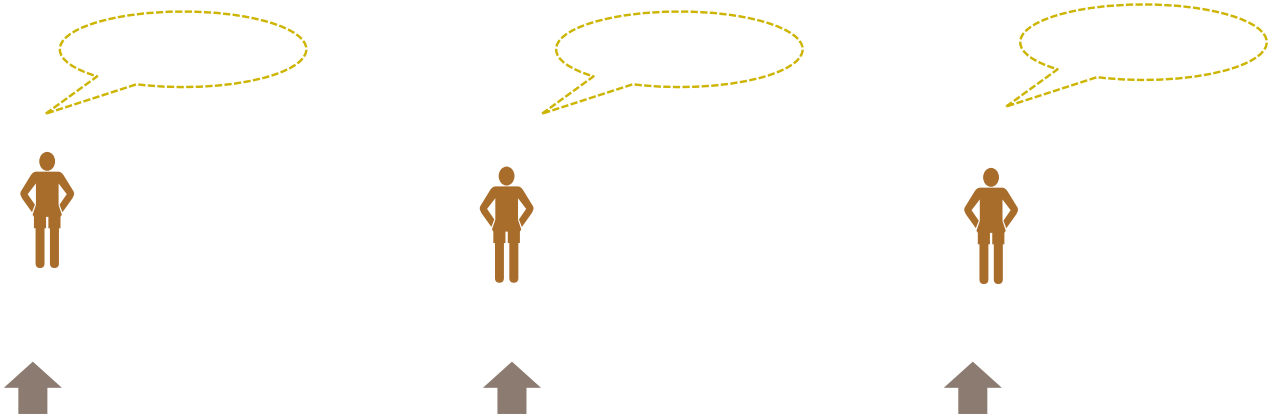
Données non-stationnaires
+
Effet non-soutenu

Recommandations

AMERICAN
PSYCHOLOGICAL
ASSOCIATION

Recommandations

- **(1) La variable indépendante doit être systématiquement manipulée**



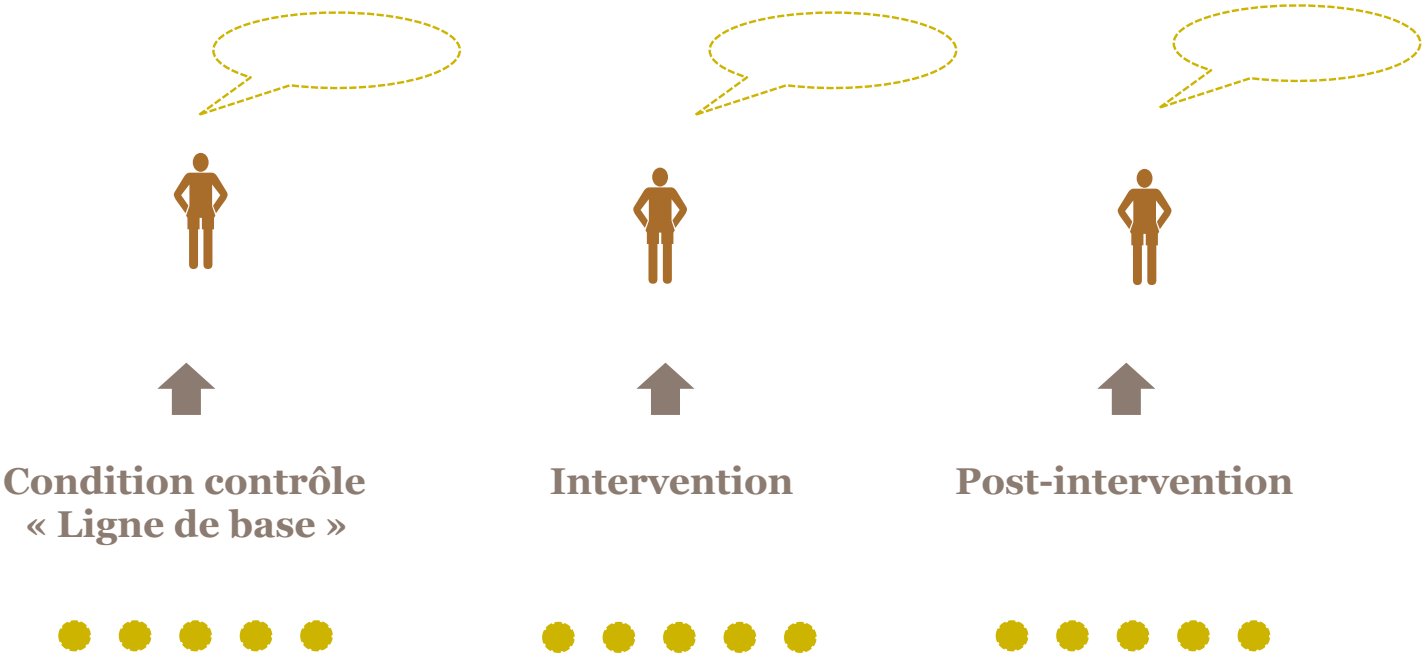
Condition contrôle « Ligne de base »

Intervention

Post-intervention

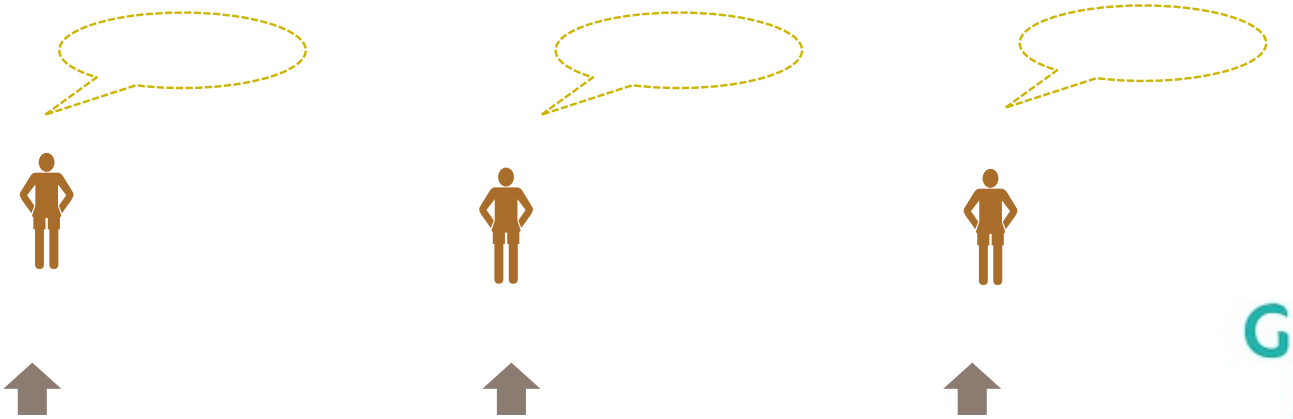
Recommandations

- **(2) La variable ou les variables dépendantes doivent être mesurées systématiquement dans le temps (par plus d'un observateur)**



Recommandations

- **(3) La phase [ligne(s) de base et intervention(s)] doit contenir un minimum de 5 points d'observation**



Recommandations *Analyse visuelle*

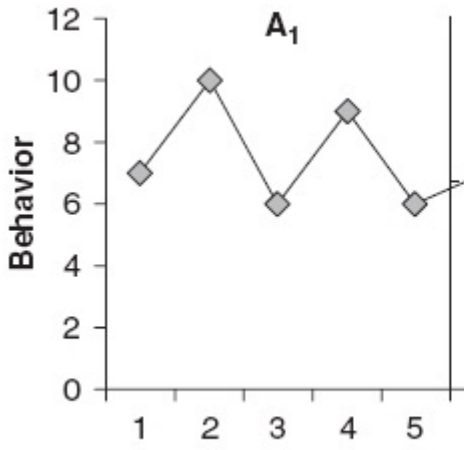
AMERICAN PSYCHOLOGICAL ASSOCIATION

- **(1) Documenter une ligne de base stable**

  Calculer la médiane de la ligne de base

  Enveloppe de stabilité

  = +80% de la ligne de base à l'intérieur ± 25% de la médiane de la ligne de base.



	7
	10
	6
	9
	6
Médiane	**7**
Médiane*0,25	**2**
25%	**9**
-25%	**5**

4 points / 5 sont dans l'enveloppe (7, 6, 9, 6)

=médiane =MEDIANE(B2:B6)

=7*0,25 =B8*0,25

=médiane +2

=médiane - 2

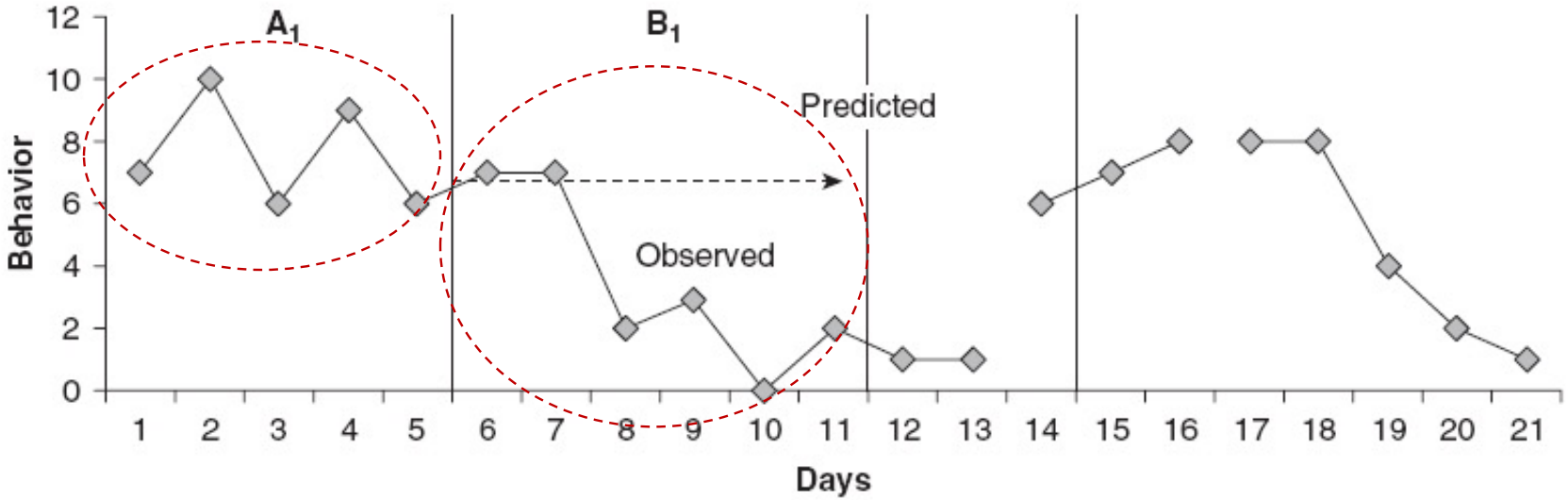
Recommandations *Analyse visuelle*

AMERICAN PSYCHOLOGICAL ASSOCIATION

- **(2) Changement médian (moyen)**

  Calculer la médiane de la ligne de base (A) et de l'intervention (B)

  A = 7 **B = 3**



Recommandations *Analyse visuelle*

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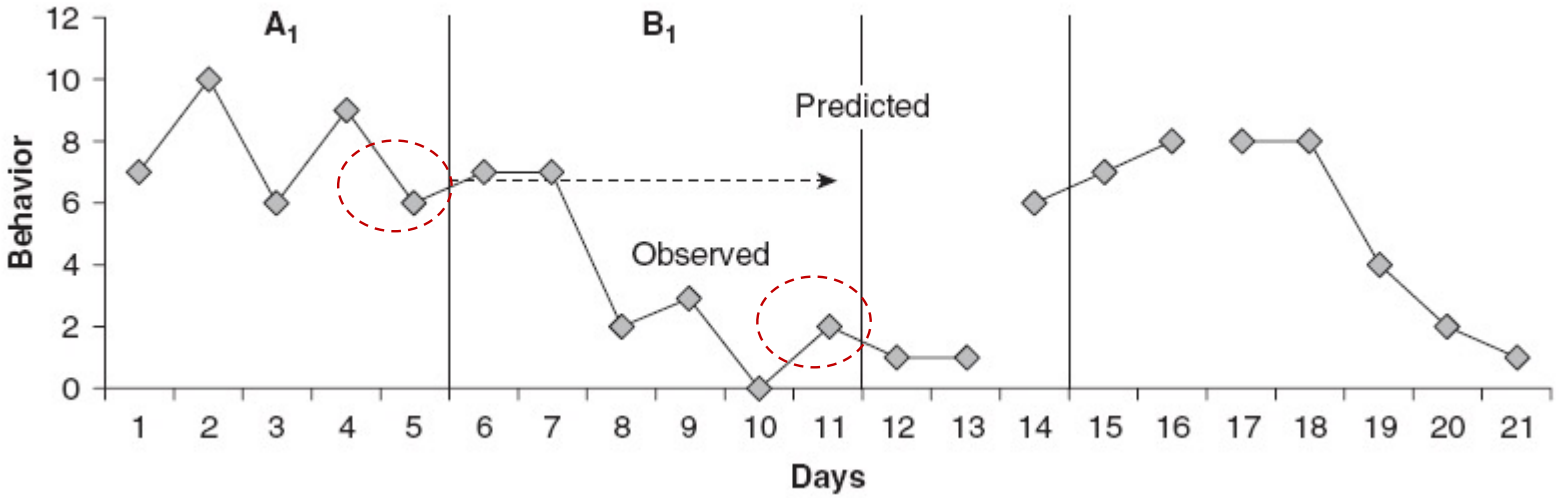
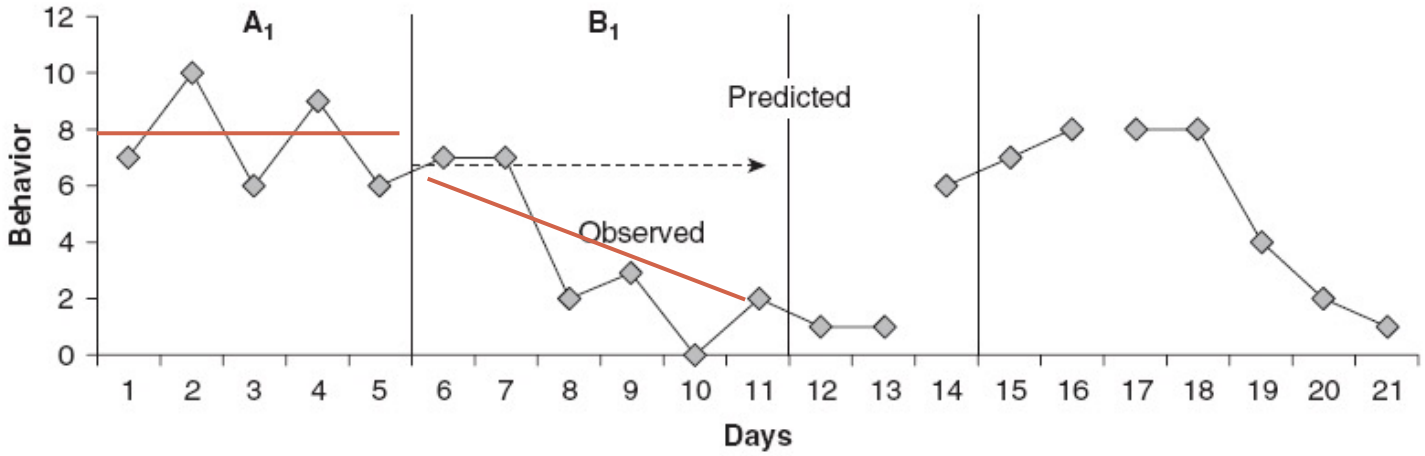
- **(3) Changement de niveau**



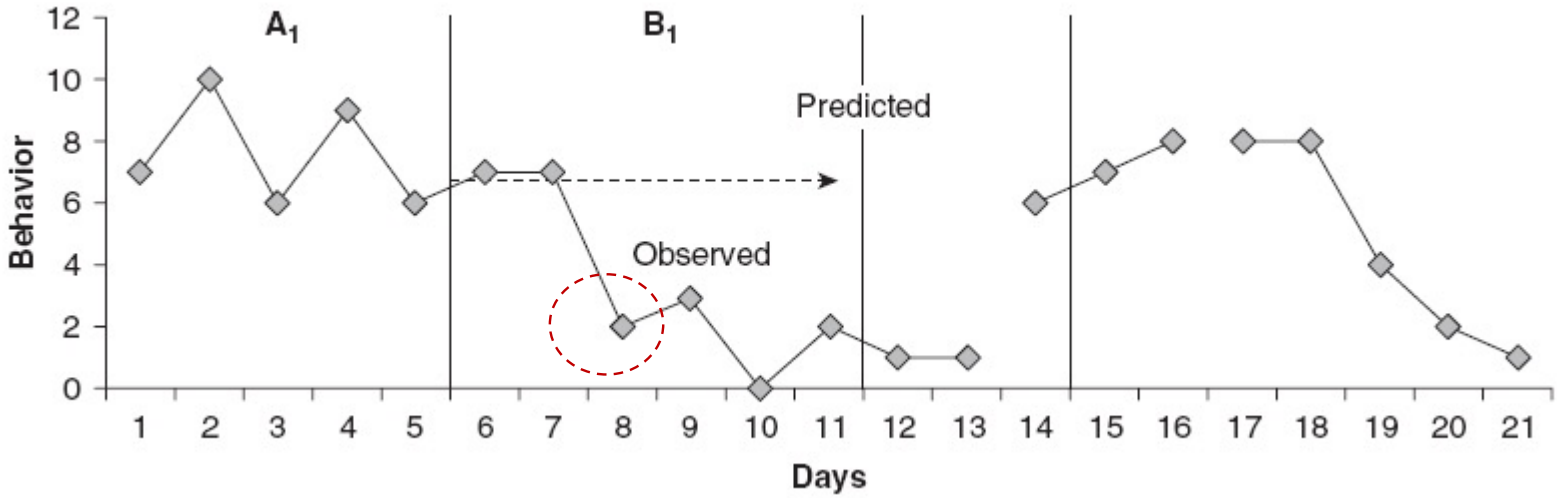
Recommandations *Analyse visuelle*

- **(4) Changement de tendance (pente)**



Recommandations *Analyse visuelle*

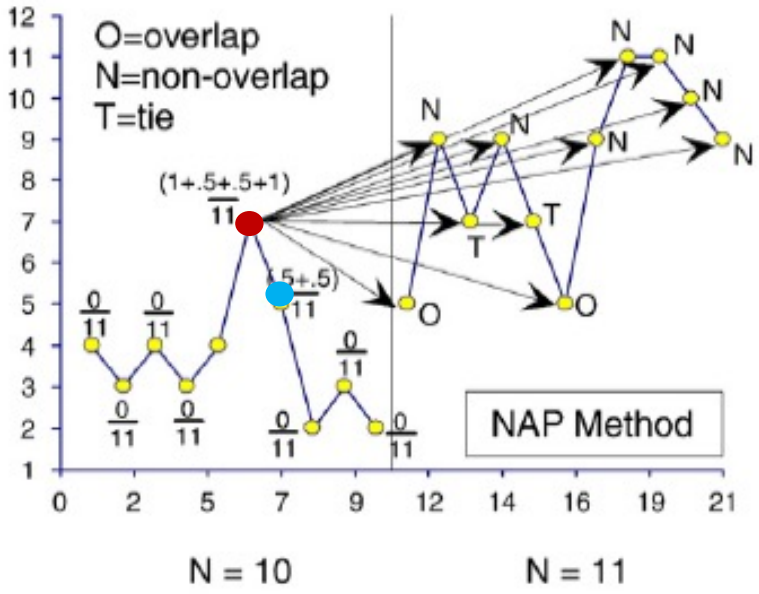
- **(5) Latence du changement**
  - **Temps nécessaire**




open
your heart
and to statistics
give me a
chance

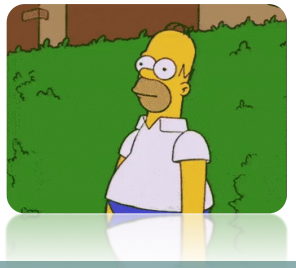
Recommandations *Analyse statistique*

- **NAP = Nonoverlap of all pairs**
  - A : 4, 3, 4, 3, 4, 7, 5, 2, 3, 2
  - B : 5, 9, 7,9, 7, 5, 9, 11, 11, 10, 9



For the example dataset, only two of the phase A datapoints show any overlap, those with values of 7 and 5. We begin with the 7, and compare it, in turn, with each phase B datapoint. An overlap counts as one point, and a tie counts as half a point. For the Figure 1 example, comparing the 6th phase A datapoint (value=7) with all phase B datapoints yields: (1, 0, .5, 0, .5, 1, 0, 0, 0, 0, 0)=3. Comparing the 7th phase A datapoint (value=5) with all phase B datapoints yields: (.5, 0, 0, 0, 0, .5, 0, 0, 0, 0, 0)=1. Thus, the overlap sum is 3+1=4. Subtracting from the total possible pairs, we get 110−4=106. Finally, NAP=106/110=96%.

10 x 11 = 110



Recommandations *Analyse statistique*

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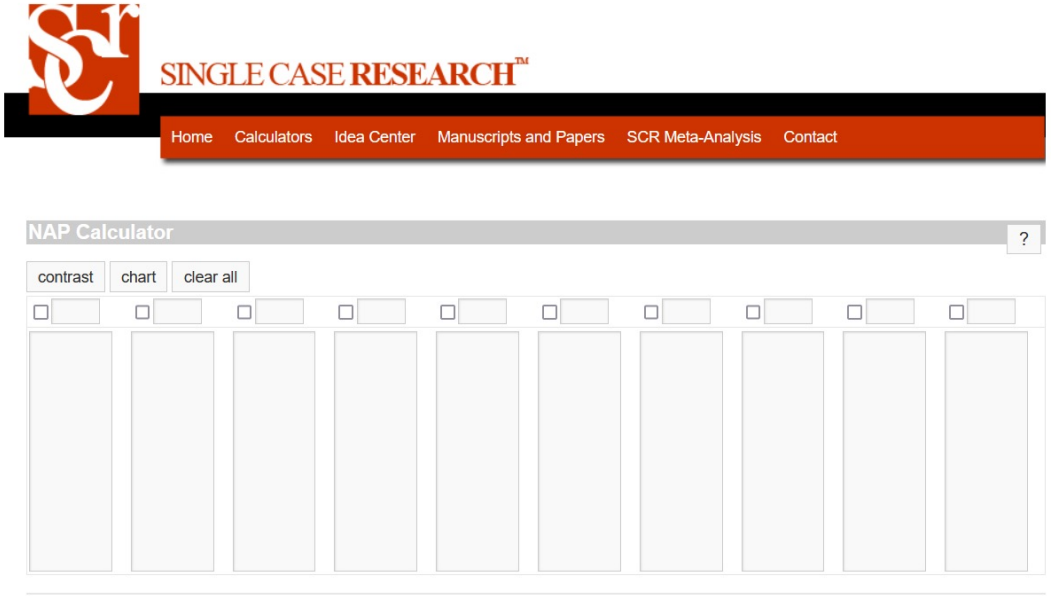
NAP (Nonoverlap of All Pairs) is a nonparametric technique for measuring nonoverlap or "dominance" for two phases. It does not include data trend. NAP is appropriate for nearly all data types and distributions, including dichotomous data. NAP has good power efficiency–about 91-94% that of linear regression for "conforming" data, and greater than 100% for highly skewed, multi-modal data. NAP is equal to the empirical AUC (Area Under the Curve) from a ROC test. Alternately, it can be derived from a Mann-Whitney U test. Also, it can be calculated by hand from small datasets. Strengths of NAP are its simplicity, its reflection of visual nonoverlap, and its statistical power. In many cases it is a better solution than tests of Mean or even Median differences across phases. [Parker, R.I., & Vannest, K.J. (2009). An improved effect size for single case research: Non-overlap of all pairs (NAP). Behavior Therapy. 40(4), 357-367.]



http://singlecaseresearch.org/calculators/nap

Recommandations *Analyse statistique*

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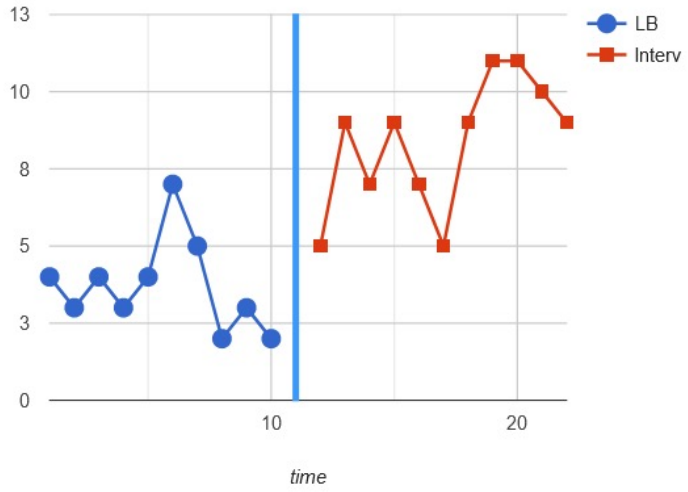
- **NAP = Nonoverlap of all pairs**
  - A : 4, 3, 4, 3, 4, 7, 5, 2, 3, 2
  - B : 5, 9, 7,9, 7, 5, 9, 11, 11, 10, 9

NAP Calculator

?

contrast | chart | clear all

LB	Interv
4	5
3	9
4	7
3	9
4	7
7	5
5	9
2	11
3	11
2	10
	9



Results

combine | to weighted | remove | clear all | download all

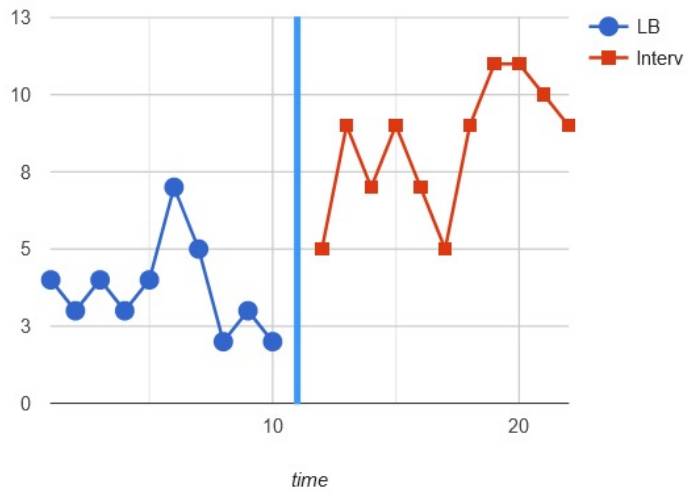
	id	Label	S	PAIRS	NAP	VARs	SD	SDnap	Z	P Value	CI 85%	CI 90%
☐	-	-	-	-	-	-	-	-	-	-	-	-
☐	0	LB vs Interv	102	110	0.9636	806.6667	28.4019	0.2582	3.5913	0.0003	0.555<>1	0.503<>1
☐	-	-	-	-	-	-	-	-	-	-	-	-

NAP Calculator

?

contrast | chart | clear all

LB	Interv
4	5
3	9
4	7
3	9
4	7
7	5
5	9
2	11
3	11
2	10
	9



Recommandations *Analyse statistique*

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  - A : 4, 3, 4, 3, 4, 7, 5, 2, 3, 2
  - B : 5, 9, 7,9, 7, 5, 9, 11, 11, 10, 9

id	Label	S	PAIRS	NAP	VARs	SD	SDnap	Z	P Value
-	-	-	-	-	-	-	-	-	-
0	LB vs Interv	102	110	0.9636	806.6667	28.4019	0.2582	3.5913	0.0003

Nombre de paires comparées

% nonoverlap of all pairs

Le *petit p* <0.05)