

Concept analysis in the instructional design process

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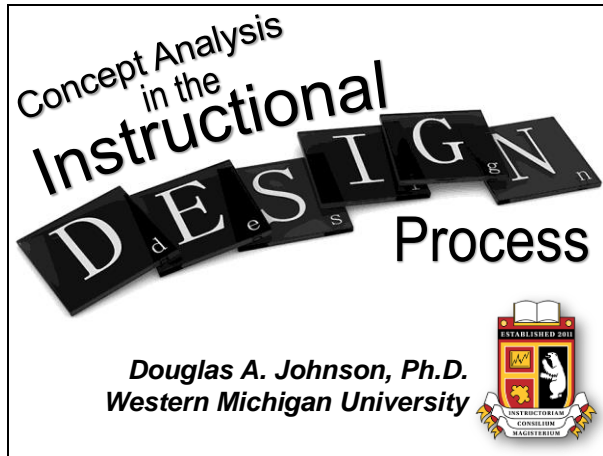
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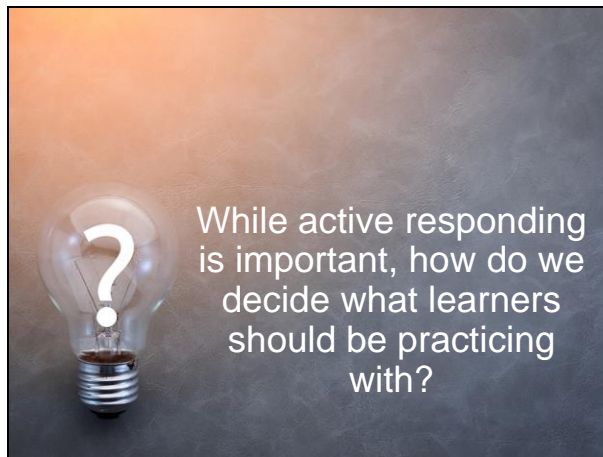
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- Active responding is important, but it needs to be meaningful
- Not random busy work

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- It may seem obvious to just tell people definition and have them practice it
- But important decisions remain

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We need to understand the meaning of concepts if we want things to be measurable and to provide feedback after meaningful responding

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Problem:
Everyday language is clumsy and therefore the meaning of a concept can be difficult to decide




- Vernacular is clumsy and obese
- One concept means different things to different people
- May not quite be able to articulate the concept yourself, even if it feels known to you

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Discussion:
What are some concepts you've had trouble pinpointing?

Could be things like, what do it mean to be: friendly, assertive, aggressive, a good team player, etc.



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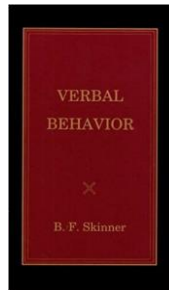
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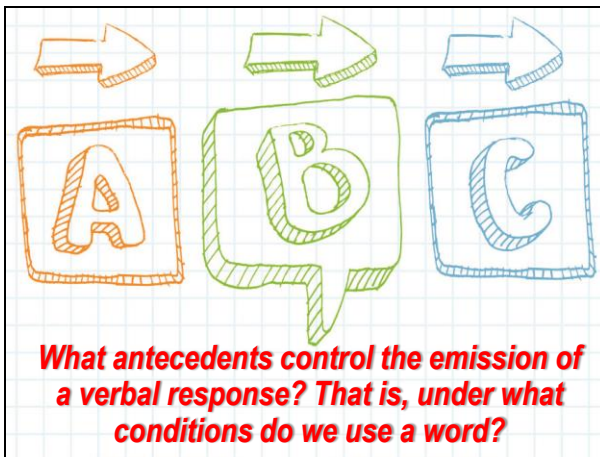
Behavioral semantics

“What conditions are relevant for the occurrence of the behavior—what are the variables of which it is a function?”
Skinner (1957)



- The study of meaning from a behavioral perspective
- Relation between verbal behavior and environmental events

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- While consequences are critically important in operant behavior, our focus in instructional design will largely be on the relation between antecedent and behavior

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**Creating a process for
breaking down a
concept**

- Susan Markle: VB editor and pilot tester of teaching machines
- Figure out what common features evoke a response
- What can you subtract to create a non-concept?

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- The Prototype analysis of Tiemann and Markle
- Start with the ideal version of concept

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- Subtract or add features to figure out what is critical in evoking the verbal label, such as number of tires for bicycle

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- More than one critical attribute, such as being human powered

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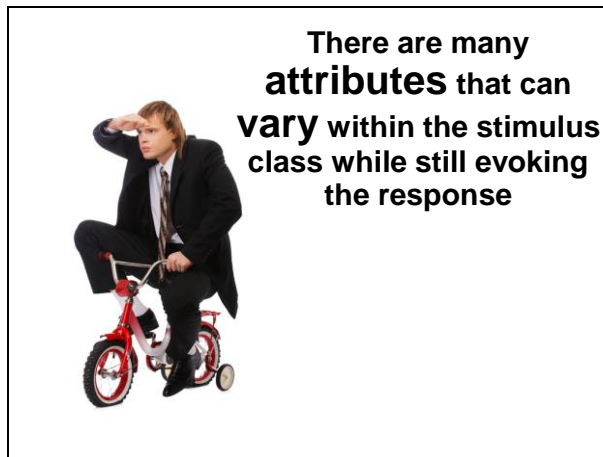
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- Importance of pedals to this concept
- Needed to identify discriminative control

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- Attributes that aren't critical to defining the concepts, but important for instruction
- Attributes that can vary without undoing status as concept
- Important for promoting generalization
- For example, size

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- Color

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- Seat and handlebar type

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- Seemingly endless variable attributes
- Select the most salient
- This is where subject-matter experts and testing plays a critical role

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Critical attributes

- A. Two wheels
- B. Completely person-powered
- C. Foot pedals

Variable attributes

- A. Color (red, blue, yellow, green)
- B. Size (small, large)
- C. Type of seat (saddle, recline, banana)
- D. Type of handlebar (straight, curved, side)

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Discussion:
Find the critical and variable attributes for your concept.

Under what conditions would you stop using the word?



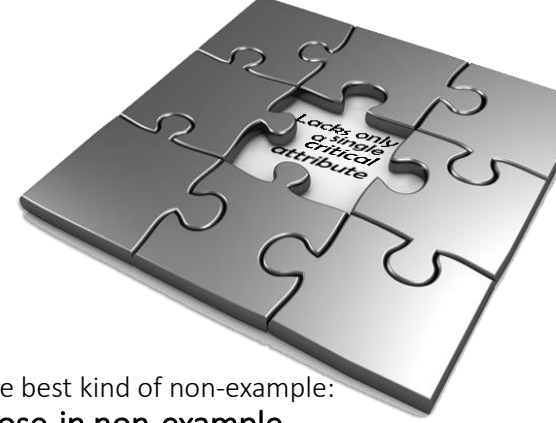
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Critical attributes
A. Two wheels
B. Completely person-powered
C. Foot pedals

Variable attributes
A. Color (red, blue, yellow, green)
B. Size (small, large)
C. Type of seat (saddle, recline, banana)
D. Type of handlebar (straight, curved, side)

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The best kind of non-example:
Close-in non-example

- Close-in nonexamples: Lacking only one critical attribute.
- This is how identify good nonexamples for enabling discrimination in efficient manner rather than randomly selecting

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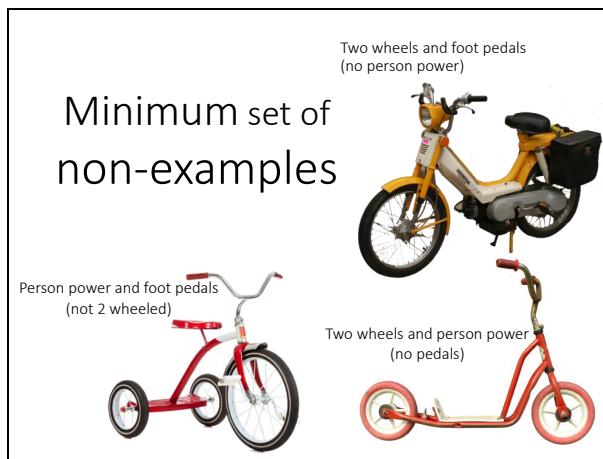
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- What is needed, at minimum, to ensure the concept is fully taught
- Minimum may not be sufficient

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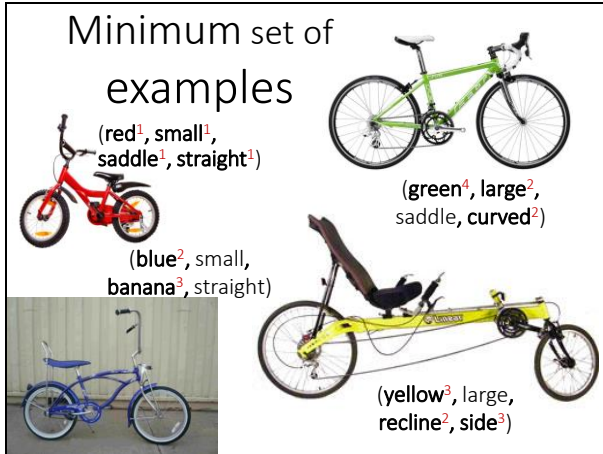
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Minimum set of
examples



(red¹, small¹,
saddle¹, straight¹)

(green⁴, large²,
saddle, curved²)

(blue², small,
banana³, straight)

(yellow³, large,
recline², side³)

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Concept of REINFORCER

Critical attributes:

- Is a stimulus
- Follows behavior of interest immediately
- Future frequency of that behavior increases

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Concept of REINFORCER

Critical attributes:

- Is a stimulus

Close-in nonexample: A rat pulls a chain, and then a few seconds afterwards that rat pushes a lever. In the future, chain pulling increases in future frequency. *Lever pushing* is the nonexample of a reinforcer (not stimulus, immediate, future increase)

- Follows behavior of interest immediately
- Future frequency of that behavior increases

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Concept of REINFORCER

Critical attributes:

- a) Is a stimulus
 - b) Follows behavior of interest immediately
- Close-in nonexample: A line cook develops a new risotto recipe. A year later, his supervisor gives him a certificate of recognition for being so innovative. In the future, the line cook develops new recipes more often. The *certificate* is the nonexample of a reinforcer. (stimulus, not immediate, future increase)

- c) Future frequency of that behavior increases

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Concept of REINFORCER

Critical attributes:

- a) Is a stimulus
 - b) Follows behavior of interest immediately
 - c) Future frequency of that behavior increases
- Close-in nonexample: A teenager is working math problems independently in class. Her teacher sees this and immediately praises her work in front of the class. In the future, the teenager works on math problems less frequently in the future. The *teacher's praise* is the nonexample of a reinforcer (stimulus, immediate, no increase)

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Variable attributes:

- a) General cultural value (good, bad)
- b) Modality (gustatory, visual, tactile)
- c) History (learned, unlearned)

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Variable attributes:


- a) **General cultural value** (good, bad)
- b) **Modality** (gustatory, visual, tactile)
- c) **History** (learned, unlearned)

Examples:

- Bert uses a pickup line to a cute girl and is immediately slapped hard. In the future, he uses similar pickup lines more often. The *slap* is the reinforcer. (**tactile, bad, learned**)
- A young boy named Alex eats his first apple and immediately experiences a delicious taste. In the future, Alex eats apples more often. The *taste of the apple* is the reinforcer. (**gustatory, good, unlearned**)
- Mary walks into a new coffee shop and immediately sees a friend she hasn't seen in years. In the future, Mary walks into that coffee shop more often. The *sight of her friend* is the reinforcer. (**visual, good, learned**)

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Which of the following events in italics are reinforcers? (more than one may be correct)




- A) A young boy named Alex eats his first apple and immediately experiences a *delicious taste*. In the future, Alex eats apples more often.
- B) A rat pulls a chain, and then a few seconds afterwards that rat *pushes a lever*. In the future, chain pulling increases in future frequency.
- C) A line cook develops a new risotto recipe. A year later, his supervisor gives him a *certificate of recognition* for being so innovative. In the future, the line cook develops new recipes more often.
- D) Bert uses a pickup line to a cute girl and is immediately *slapped hard*. In the future, he uses similar pickup lines more often.
- E) A teenager is working math problems independently in class. Her teacher sees this and immediately *praises* her work in front of the class. In the future, the teenager works on math problems less frequently in the future.

- With proper selection, multiple-choice can potentially be more instructive and challenging than alternatives

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Discussion:
Generate some teaching sets for your concept that show the boundary and breadth of that concept



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THANK YOU

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AND MANAGEMENT LAB



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