

# On the Concept of the Operant

Based on Catania (1973)

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HIAK

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## From Watson (1930)

By **response** we mean anything the animal does - such as turning toward or away from a light, jumping at a sound, and more highly organized activities such as building a skyscraper, drawing plans, having babies, writing books and the like. (p. 6).

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## Behavior stream

"Behavior is very fluid; it isn't made up of lots of little responses packed together. I hope I will live to see a formulation which will take this fluidity into account."  
(Skinner, 1965)

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### Reflex

- A reflex is defined as a correlation between to events.
- That is, classes of stimuli and classes of responses.
- Definitions of stimuli and responses are dependent on each other.

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### Definition of an operant

- In terms of the correlation of stimulus and response classes
- The temporal ordered is reversed with respect to reflexes.
- Relations between environmental events and behavior.

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### Continuous nature of behavior

Skinner (1953):

. . . any unit of operant behavior is to a certain extent artificial. Behavior is the coherent, continuous activity of an integral organism. Although it may be analyzed into parts for theoretical or practical purposes, we need to recognize its continuous nature in order to solve certain common problems. (p. 116)

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### Dimensions of behavior

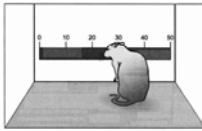


FIG. 5.2. The apparatus used by Antonitis (1951). Rats could poke their noses anywhere along the 50-cm horizontal slot to obtain reinforcement.

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### Restrictions on responses

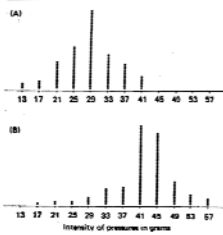


Figure 2.10 Distribution of response forces when (A) all responses with a force of more than 21g were reinforced, and (B) when all responses with a force of more than 36g were reinforced (after I lays and Woodbury, cited in Hull, 1943).

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### Operants

- Descriptive operant
- Functional operant

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### Descriptive and functional operant

- Descriptive operant is specified by stating the relations that are experimentally programmed
- Functional operant is specified by stating the relations that are produced by the contingencies specified in the program.
- The dimensions of the descriptive operant are specified in advance of the existence of the behavioral unit that actually emerges. The dimensions of a functional operant can only be described after variation and selection have done their work.

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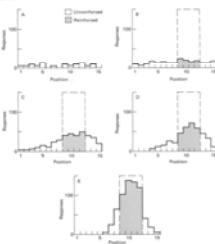
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### Response classes

**FIGURE 8-7** Hypothetical response distributions illustrating differential reinforcement of response location. A and B refer to response into 30-s continuous reinforcement in the control condition. The distribution of response positions when no response are reinforced is shown in A. In B through E, responses of positions 5 through 22 (bounded by vertical dotted lines) are reinforced with food. Each trace shows reinforced responding. In B, the effects of reinforcement spread across the entire length of the axis (the spread is called induction). In C, through E, responding becomes reinforced more and more to the position correlated with reinforcement; the concentration of the effects of reinforcement is called attention. Induction with continuous operant reinforcement; the distribution of responses becomes stable and corresponds fairly closely, as in E, to the class of responses correlated with reinforcement.



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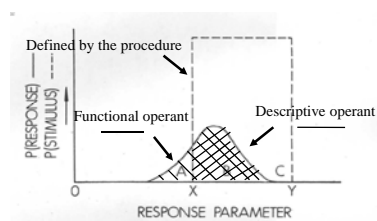
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### Two operants



**Figure 1.** Hypothetical response probability or relative frequency (solid line) and the probability with which the response produces a stimulus (dashed line) as a function of some property of the response. Details as text.

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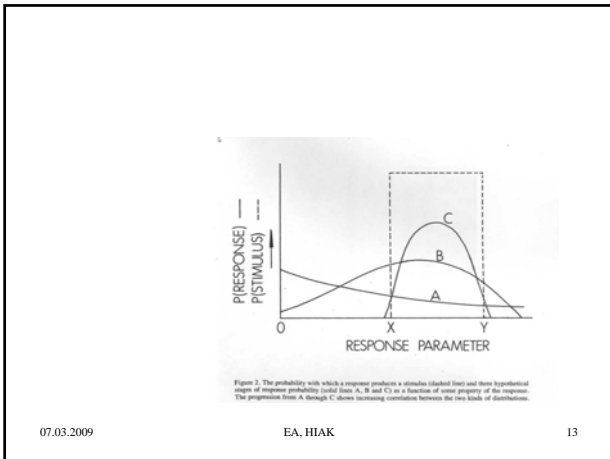
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### Correlations

Table 1  
Correlations ( $r$ ) between stimulus probabilities and relative frequencies of responding along a response dimension for six hypothetical response distributions (A through F).

Response dimension (Class intervals)	Stimulus Probability	Relative Frequency of Response					
		A	B	C	D	E	F
1	0	0.2	0.4	0.0	0.0	0.0	0.0
2	0	0.2	0.2	0.1	0.0	0.0	0.2
3	1	0.2	0.1	0.4	0.5	0.8	0.8
4	1	0.2	0.1	0.3	0.5	0.2	0.0
5	0	0.2	0.2	0.2	0.0	0.0	0.0
Correlation coefficient ( $r$ ):		0.00	-0.75	+0.87	+1.00	+0.79	+0.53

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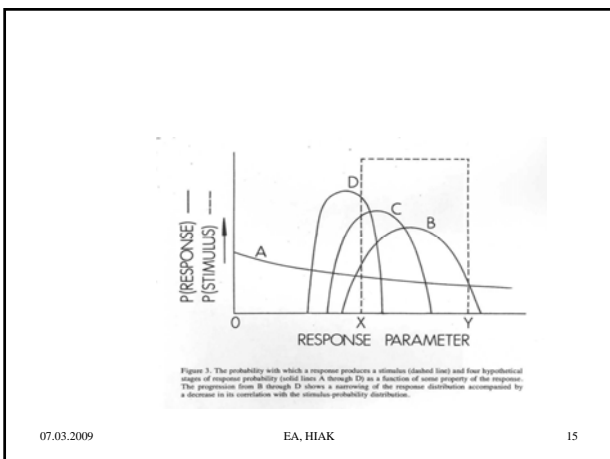
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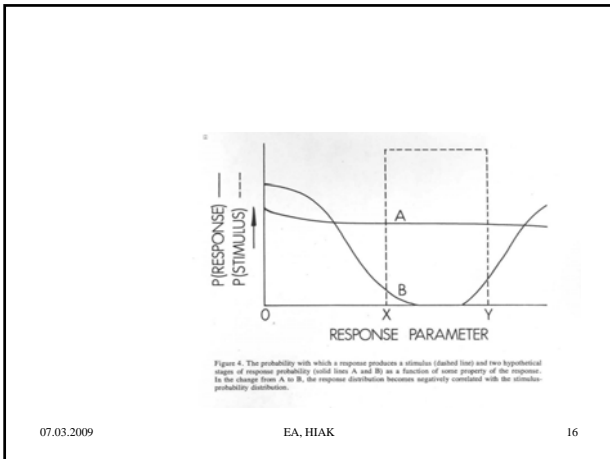
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### Stoperant

- The absence of responses, however, as well as their presence, can define a class, it might well be called a stoperant class (Catania, 1973, p. 112)

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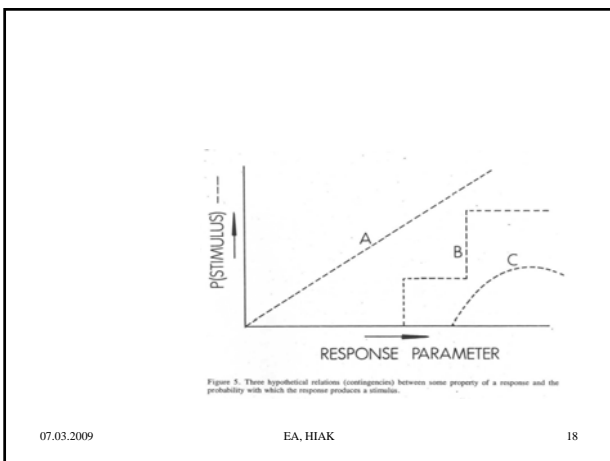
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### The use of the term operant

- As a class of responses defined by production of stimuli
  - Stimulus-probability or contingency distribution
- As a class of responses generated by the contingencies
  - The response distribution
- As a response-stimulus relation
  - Correlation between stimulus probability and response distributions

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