- **“The human species took a crucial step forward when its vocal musculature came under operant control in the production of speech sounds. Indeed, it is possible that all the distinctive achievements of the species can be traced to that one genetic change”**

- **p. 117 in Skinner, B. F. (1986). The evolution of verbal behavior. *Journal of the Experimental Analysis of Behavior*, 45, 115-122.**

THE ABC's OF VERBAL BEHAVIOR

A. Charles Catania

NATIONAL AUTISM CONFERENCE

Penn Stater Conference Center

August 2016

ANTECEDENTS

BEHAVIOR
(WORDS)

CONSEQUENCES

I. Intro and a Capsule History
II. Some Behavior Analysis ABCs
III. The Basic Verbal Units
IV. Tacting and Private Events
V. Autoclitics
VI. Verbal Shaping
VII. Verbally Governed Behavior
VIII. Attending to Verbal Stimuli
IX. Reprise on Verbal Classes
X. Summing Up

What makes behavior verbal?

Verbal behavior is “effective only through the mediation of other persons” (Skinner, 1957, p. 2)

- The irreducible function of verbal behavior is that it is an efficient way in which one individual can get another individual to do something
- Sometimes the effects are nonverbal, as when we ask someone to do something; sometimes the effects are verbal, as when we change what someone has to say about something
- All other functions of verbal behavior (e.g., communication, truth, logic) are derivatives of this primary function and gain their significance only through it

The Functions of Verbal Behavior

- Some examples:
  - We communicate items of information or convey our thoughts or ideas because a consequence is that others may act upon them
  - We express our feelings and emotions because a consequence is that others may then behave differently toward us
  - The thoughts or ideas or feelings or emotions do not travel from the speaker to the listener. Only the words do - and that only in a special sense

Tuesday, August 2, 2016

why isn't it expression of emotion? Gorilla perfectly capable of showing its emotions, and selection doesn't duplicate what already works.

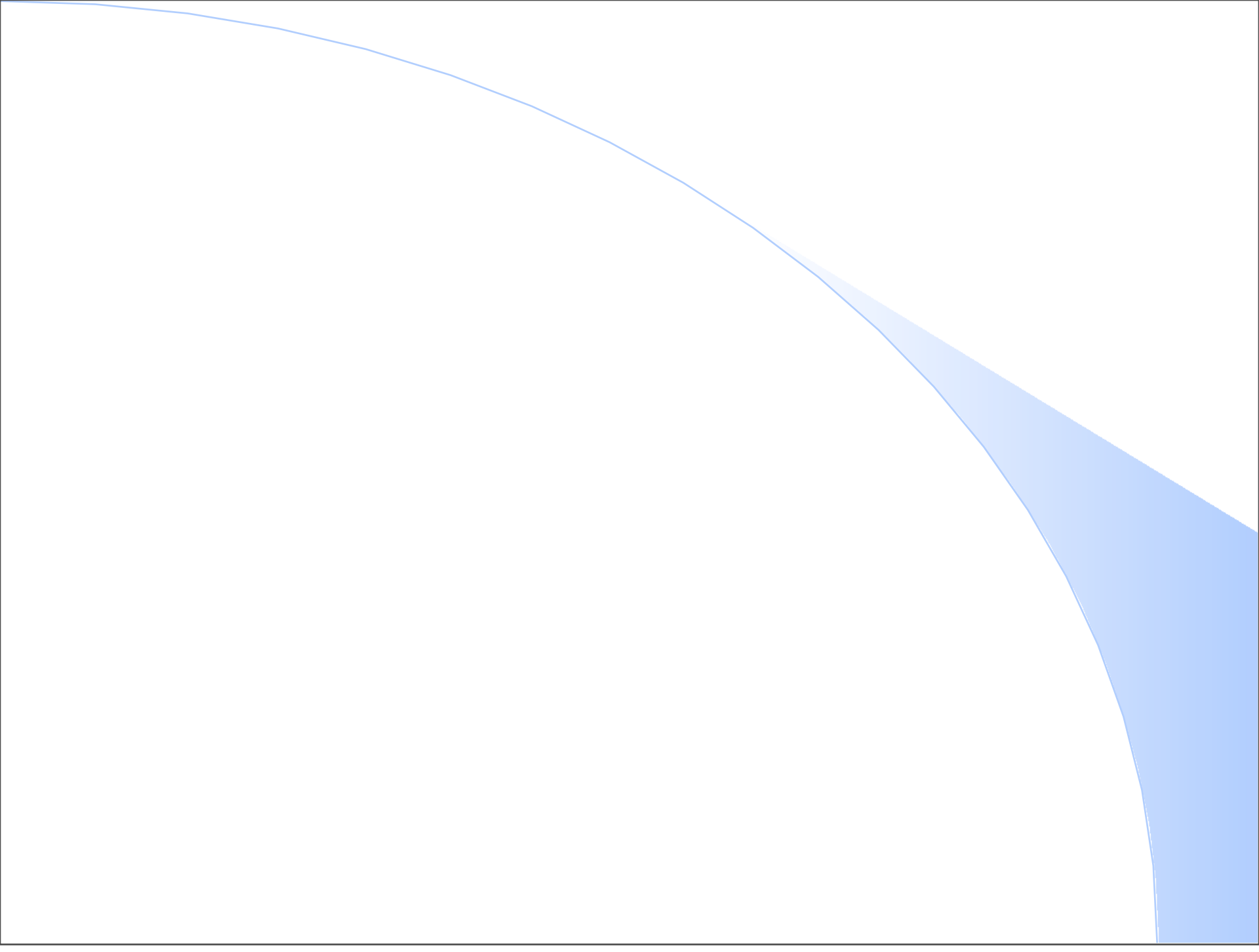
Skinner's book, *Verbal Behavior*

- Some history
  - the William James lectures (1948)
  - publication of the book (1957)
  - a review by Chomsky (1959)
  - some decades of eclipse
    - but see where Chomsky is now
  - so, nevertheless, enduring effects

Reference Harpers Chomsky article

Skinner's book, *Verbal Behavior*

- Geopolitical, economic, social factors
  - WWII: German Enigma code broken
  - Turing's mathematics
  - Sputnik and the space race
  - Chomsky's transformational grammars
  - language translation and grants
  - ABA and autism



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Some ABCs of Behavior Analysis

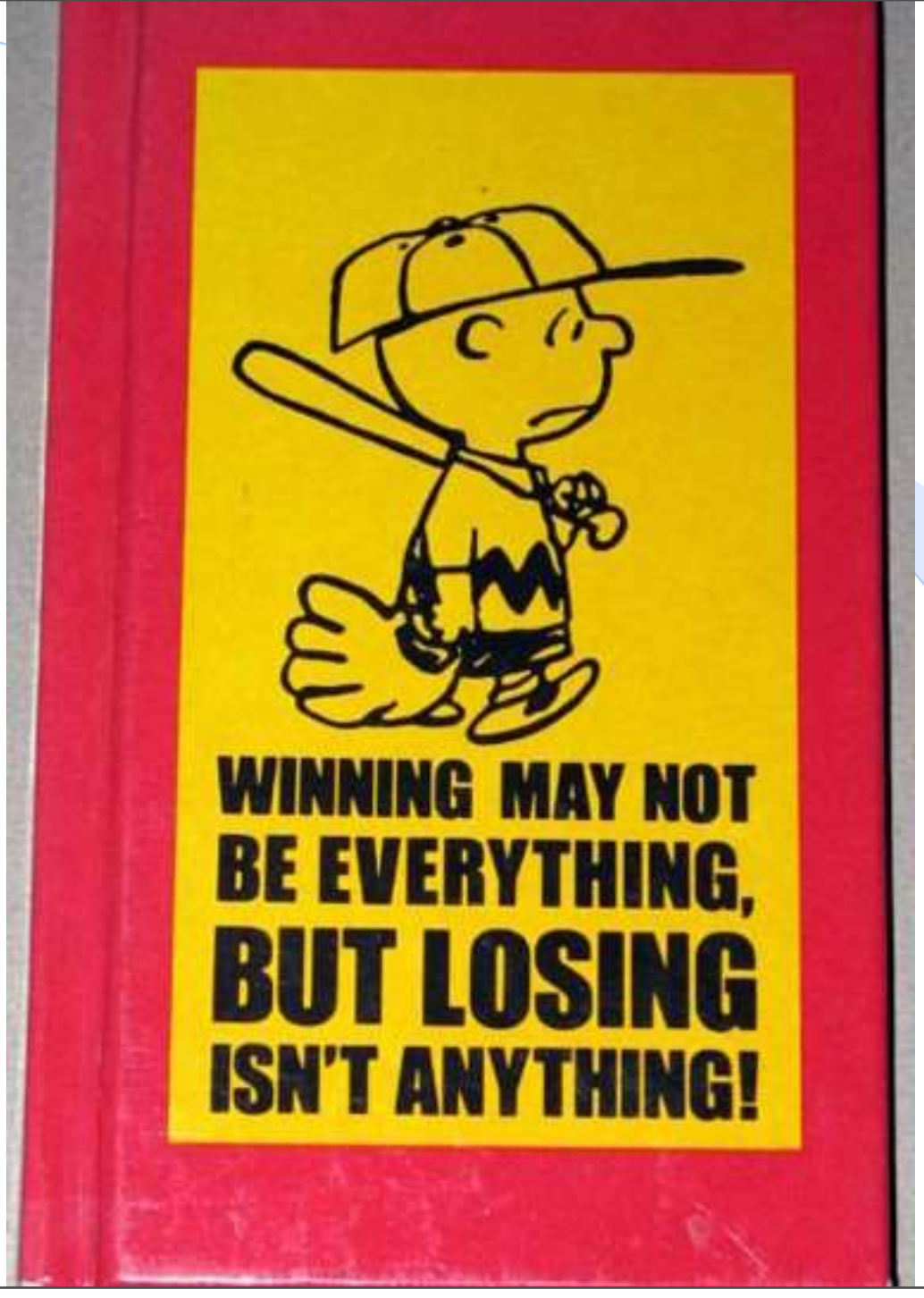
- Reinforcement, Extinction, Side-Effects
- Negative Reinforcement, Punishment
- Reinforcement as Selection
- Operant Classes
- Attending to Stimuli

Reinforcement, Extinction, Side-Effects

- Popular assumptions about reinforcement and about getting rid of problem behavior
  - These assumptions probably originated in superficial treatments, as in intro psych courses taught by those without a background in behavior analysis
- Ignoring (extinction) is not the procedure of choice

Reinforcement, Extinction, Punishment

- Ignoring (extinction) isn't the procedure of choice
- For many of the same reasons, plus others, punishment isn't the procedure of choice either
  - It too has many undesirable side-effects



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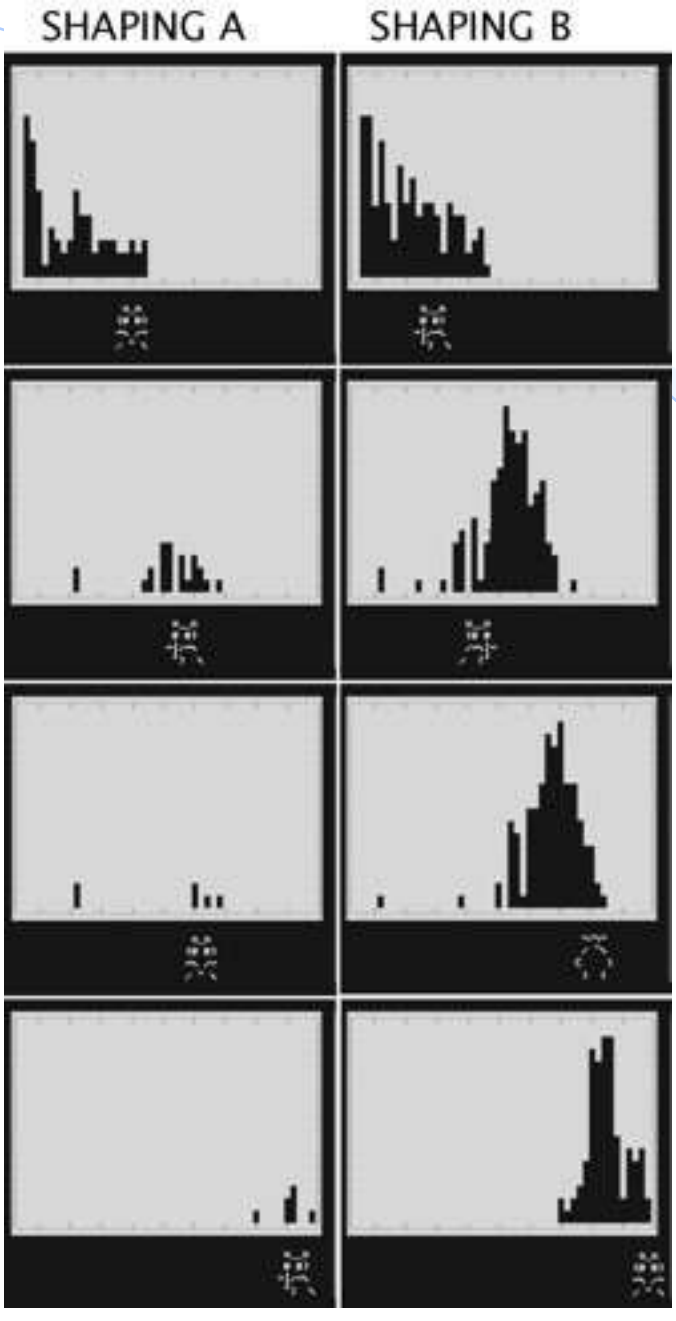
Reinforcement as Selection

- The selection of behavior
- Artificial and natural selection
- Shaping as a skill and (sometimes) as an art form
  - Shaping is differential reinforcement
  - Shaping must balance between too few and too many reinforcers
  - Reinforcers must depend on behavior that moves in the target direction


SHAPING A
SHAPING B

Operant Classes

- We define classes of behavior in terms of their function, not in terms of what they look like
- Examples:
  - The rat's lever press
  - The child's self-injurious behavior (SIB)
  - And sometimes one class is nested within another, as when SIB is part of a larger behavior class all members of which get attention from caregivers

Attending to Stimuli

- We’re affected by stimuli only if we attend to them, and we attend most to those related to reinforcers
  - We’re likely to attend to aversive stimuli only if we can do something about them
  - Otherwise, we’re likely to ignore them or look away
- Attention-Deficit, as in ADHD, occurs when stimuli aren’t attended to
  - often because they involve weak or delayed reinforcers

The Three-Term Contingency

In presence of S1, R1 may produce C1

In presence of S2, R2 may produce C2

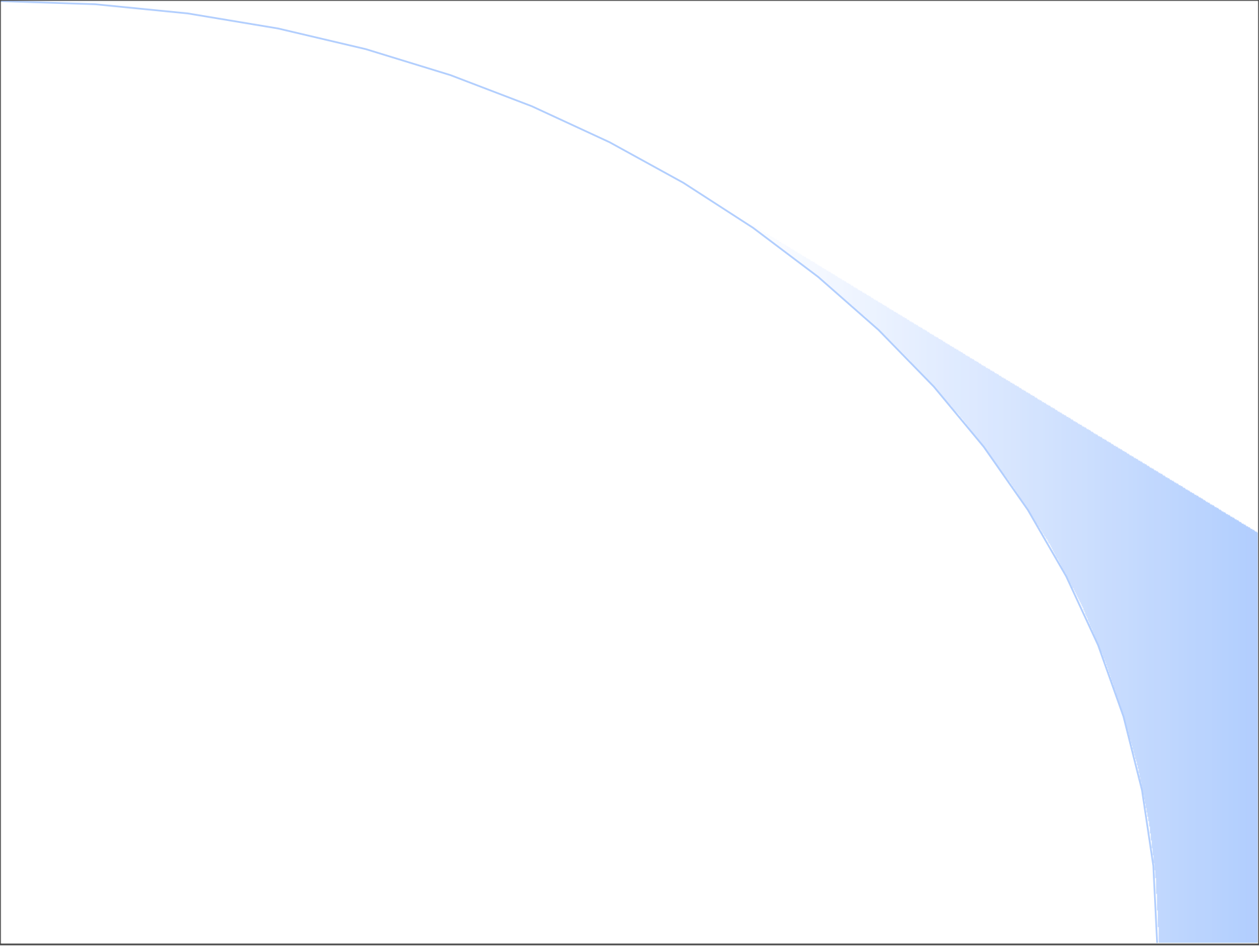
S = Stimulus

R = Response

C= Consequence

When R1 in presence of S1 differs from R2 in presence of S2, we say that the individual discriminates S1 from S2.

Discuss the language of discrimination at the colloquial level



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WHAT ARE THE FUNCTIONAL PARTS OF VERBAL BEHAVIOR, WHAT ARE THEY GOOD FOR, AND HOW ARE THEY SHAPED?

Verbal Behavior

Verbal Behavior

- **THE FORMAL VERBAL CLASSES**
- **Echoic Behavior**
- **Dictation-Taking**
- **Textual Behavior**
- **Transcription**

Verbal Behavior

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- **Echoic Behavior**
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- **Textual Behavior**
- **Transcription**

- **THE TACT AND TACTING**
- **Naming**
- **Extensions of the Tact**
- **Metaphor**
- **Private Events**

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- **INTRAVERBAL BEHAVIOR**

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- INTRAVERBAL BEHAVIOR
- THE MAND AND MANDING

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- AUDIENCES
- Listener Behavior

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- THE MAND AND MANDING

- AUDIENCES
- Listener Behavior

- COMBINATIONS OF VERBAL PROCESSES
- Multiple Causation
- Autoclitic Processes
- Higher-Order Classes and Adduction
- Verbally Governed Behavior

The Formal Verbal Classes

- **Echoic behavior**
  - A vocal verbal stimulus occasions a corresponding vocal verbal response
- **Dictation-taking**
  - A vocal verbal stimulus occasions a corresponding written response
- **Textual behavior**
  - A written verbal stimulus occasions a corresponding vocal verbal response
- **Transcription**
  - A written verbal stimulus occasions a corresponding written response

The Formal Verbal Classes

- **Echoic behavior**
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The Formal Verbal Classes

- **Echoic behavior**: **A vocal verbal stimulus occasions a corresponding vocal verbal response**

  But the correspondence is not one of physical units

  Along many dimensions, Daddy's deep male voice is very different from the voice of his young daughter

  Consider dialects, speech mannerisms, and other sources of individual vocal differences

  Instead, the units of correspondence must be phonetic ones shaped by verbal communities

The Formal Verbal Classes

- **Echoic behavior**: **A vocal verbal stimulus occasions a corresponding vocal verbal response**

  The units of correspondence must be phonetic ones shaped by verbal communities

  How can this work?

  The coordinations required in speech are complex

  If sounds made by caregivers become reinforcers by virtue of their relation to important events in the infant's life, then self-produced sounds can be shaped by the reinforcing consequences of ever closer approximations to those sounds

The Formal Verbal Classes

- **Dictation-taking: A vocal verbal stimulus occasions a corresponding written response**

  Here there is no issue of physical correspondence

  Spoken words have no visual properties

  Written words have no auditory properties

  The sound of a spoken “A” has no particular physical relation to the look of a written one

  Clearly, these arbitrary relations must be taught

The Formal Verbal Classes

- **Textual behavior**: **A written verbal stimulus occasions a corresponding vocal verbal response**

  Here again there is no issue of physical correspondence

  Written words have no auditory properties

  Spoken words have no visual properties

  The look of a written “A” has no particular physical relation to the sound of a spoken one

  Clearly, again, these arbitrary relations must be taught

The Formal Verbal Classes

- **Transcription**: **A written verbal stimulus occasions a corresponding written response**

  The issue of the correspondence of verbal units rather than physical units is more obvious in transcription than in echoic behavior

  A a $\mathcal{A}$ a A G g $\mathcal{G}$ g G R r $\mathcal{R}$ r r D d $\mathcal{D}$ d D

  H h h N n n E e E e e Q q Q q Q T t T t

  There are no simple physical features that make the groups of stimuli above members of their various respective classes

The Formal Verbal Classes

- **Transcription**: **A written verbal stimulus occasions a corresponding written response**

  And look at how many features some very different letters have in common:

  m h n e l E F P R B

  I i L l M N U V W O Q D

  Clearly, once again, these arbitrary relations must be taught

The Formal Verbal Classes

Coming back to

- **Echoic behavior**: **A vocal verbal stimulus occasions a corresponding vocal verbal response**

  As in transcription, the correspondence is not one of physical units

  The units of correspondence must be phonetic ones shaped by verbal communities

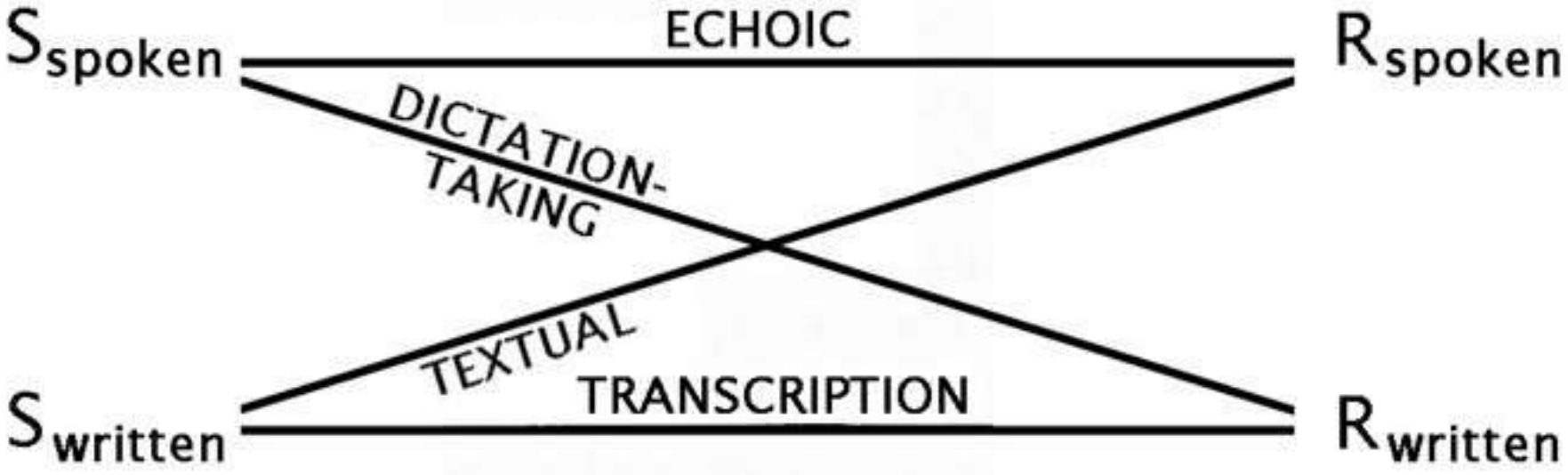
  Along many dimensions, Daddy's deep male voice is very different from the voice of his young daughter

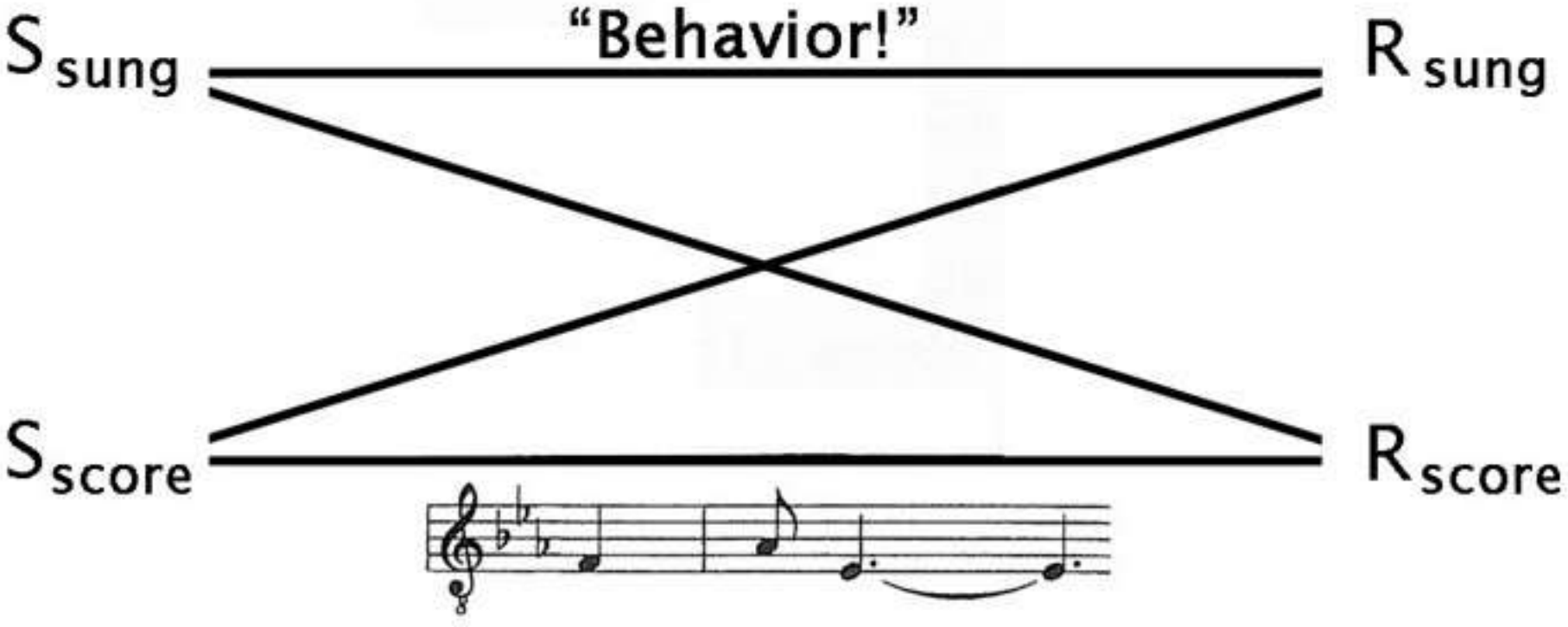
  Mommy's higher female voice is very different from the voice of her young son

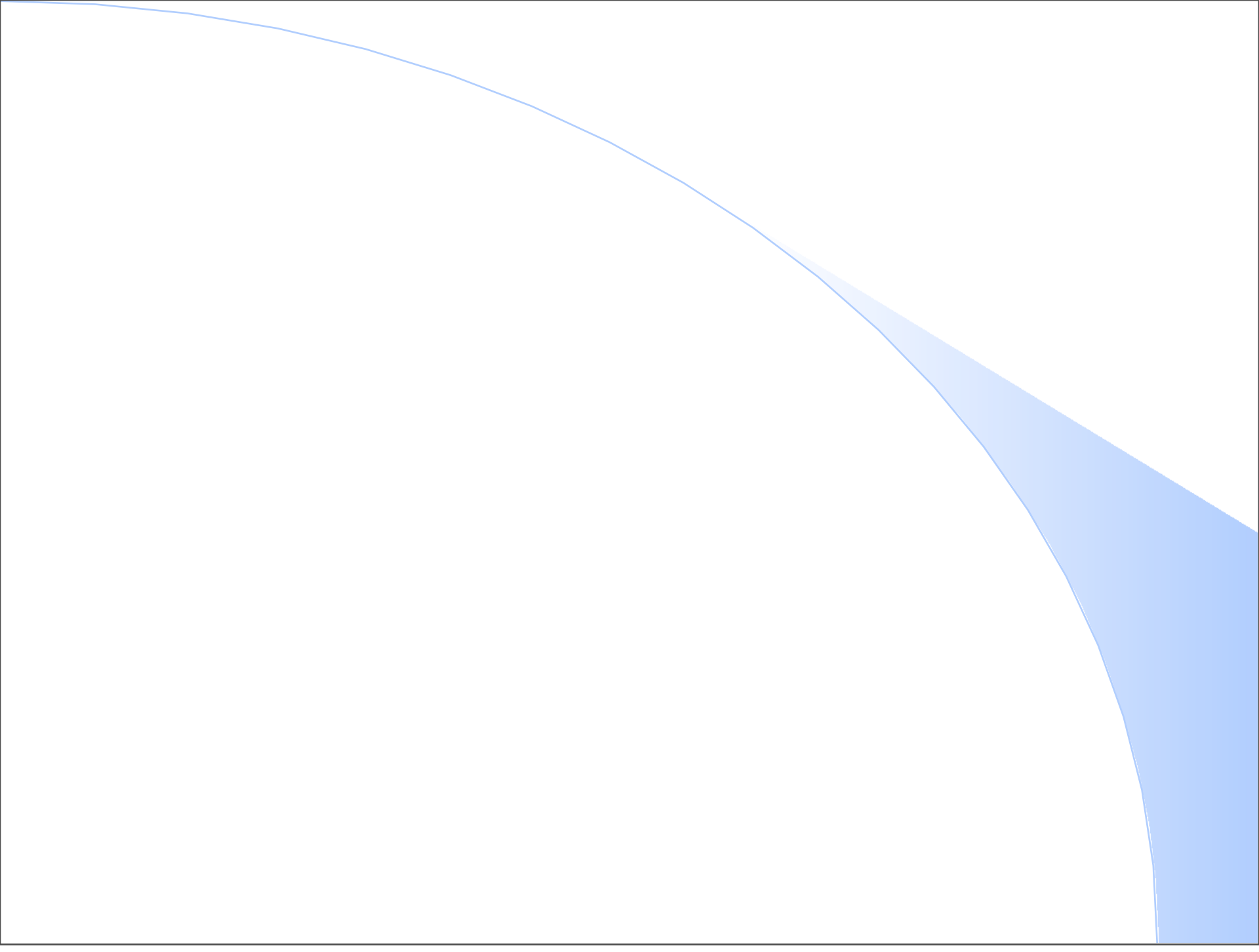
The Formal Verbal Classes

- **(VB, pp. 65-6)** ***Since the term "reading" usually refers to many processes at the same time, the narrower term "textual behavior" will be used here.***
- Consider what "pure" textual behavior or transcription or dictation-taking must be: have you ever been reading a book to find you've reached the bottom of a page without being able to say what you read at the top or in the middle?

- The boss and the secretary and other examples


S spoken
ECHOIC
R spoken
DICTATION-
TAKING
TEXTUAL
TRANSCRIPTION
S written
R written


“Behavior!”
S sung
R sung
S score
R score



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Verbal Behavior

- THE FORMAL VERBAL CLASSES
- Echoic Behavior
- Dictation-Taking
- Textual Behavior
- Transcription

- THE TACT AND TACTING
- Naming
- Extensions of the Tact
- Metaphor
- Private Events

- INTRAVERBAL BEHAVIOR

- THE MAND AND MANDING

- AUDIENCES
- Listener Behavior

- COMBINATIONS OF VERBAL PROCESSES
- Multiple Causation
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- Higher-Order Classes and Adduction
- Verbally Governed Behavior

The Tact and Naming

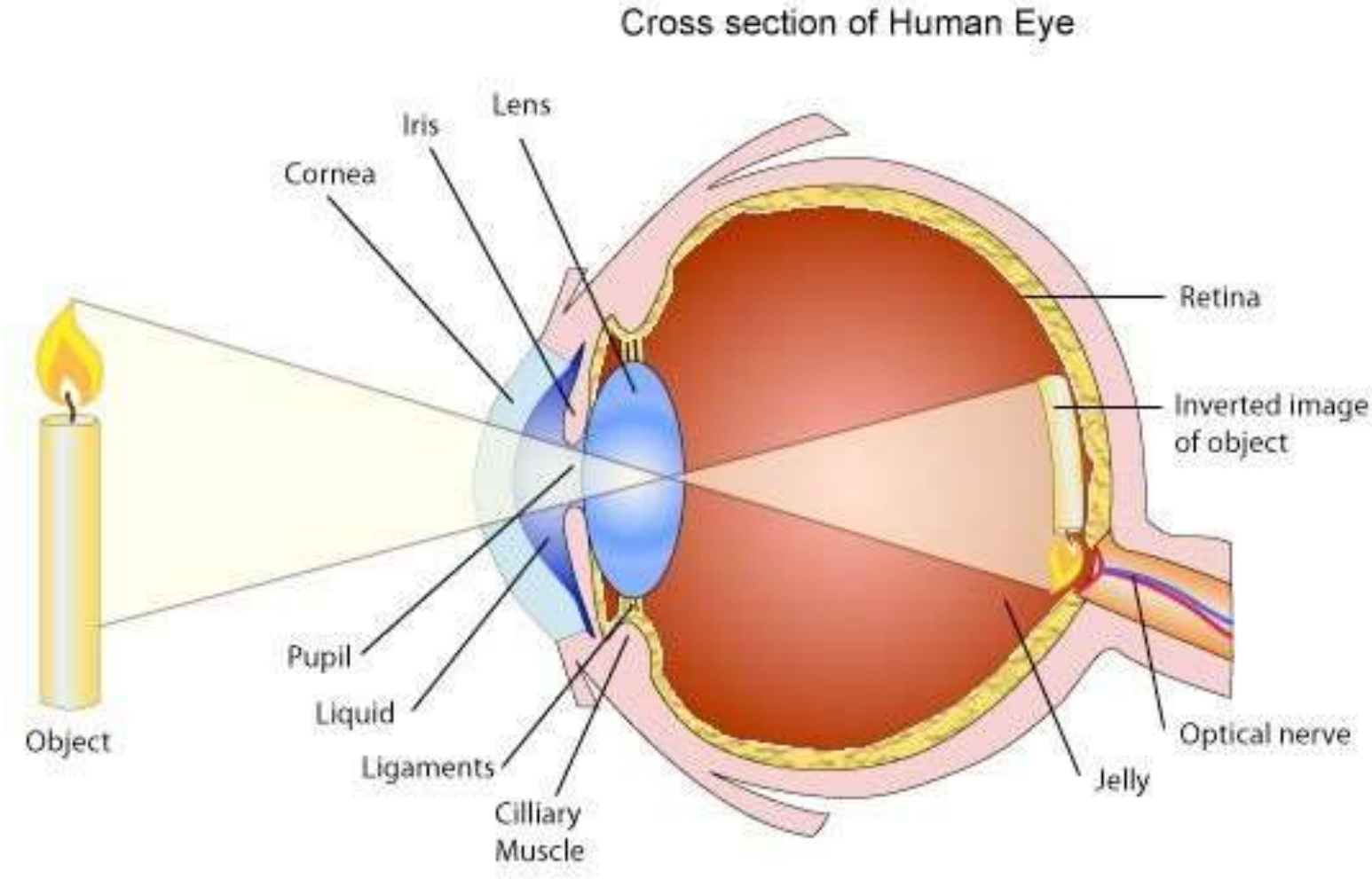
- **Tact:** a verbal discriminative response (as when the verbal response ***apple*** in the presence of an apple is said to tact the apple). The tact captures stimulus control as it enters into verbal behavior. The tact relation includes only responding in the presence of or shortly after the tacted stimulus and therefore is not equivalent to naming or reference
- **Naming:** a higher-order class that involves arbitrary stimulus classes (things or events with particular names) and corresponding arbitrary verbal topographies (the words that serve as their names) in a bi-directional relationship. Naming requires tacting, echoic behavior and listener behavior

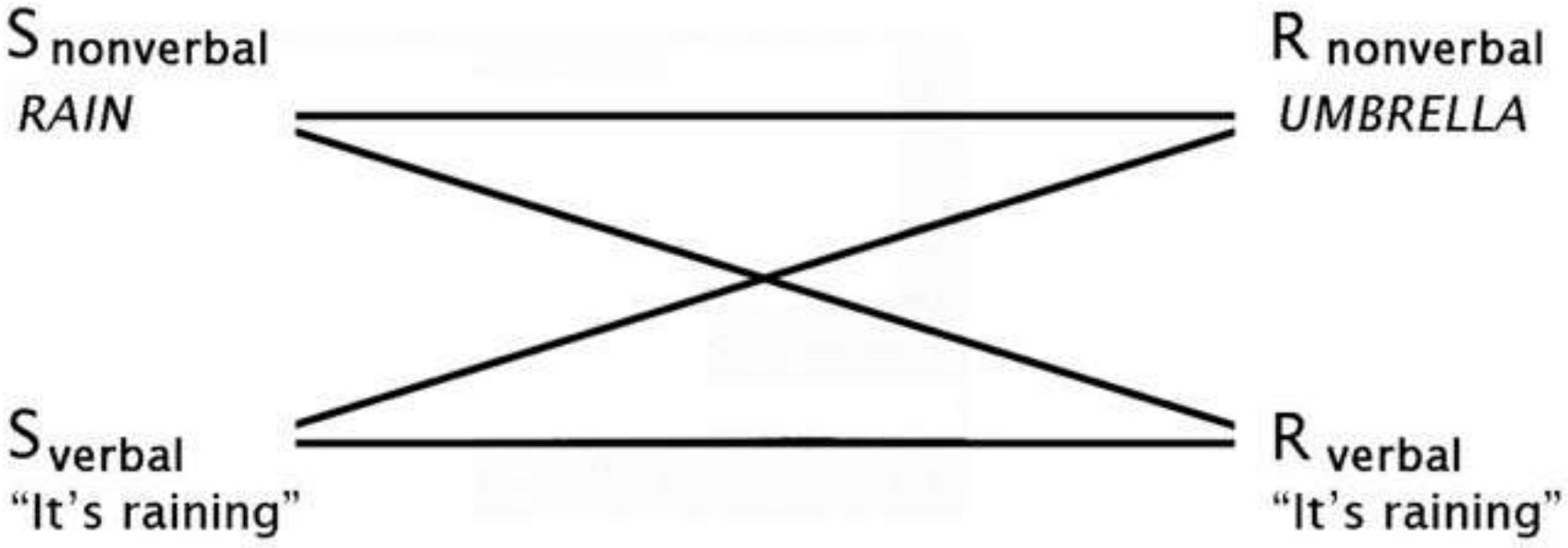
The Tact and Naming

- **Other Aspects of Tacting and Naming**
  - Extensions of the Tact
  - Metaphor
  - Private Events

The Direction of Effect in Tacting

- It was an important step forward in the analysis of vision when the ancients recognized that vision depended not on emanations from the eye that made contact with seen objects, but rather on the entry into the eye of light produced by or reflected from objects
- The language of reference raises a similar issue of direction: its implied direction is from the speaker to the referenced object
- The language of tacting implies the opposite direction, though it remains too easy to say that we tact objects rather than that objects occasion our tacts


Cross section of Human Eye
Lens
Iris
Cornea
Retina
Inverted image of object
Pupil
Liquid
Ligaments
Cilliary Muscle
Jelly
Optical nerve
Object


S nonverbal
RAIN
R nonverbal
UMBRELLA
S verbal
"It's raining"
R verbal
"It's raining"

Some VB quotations on tacting

- **(p. 82) “Thank you” *is often nothing more than a unitary response characteristically reinforced upon an appropriate occasion***
  - And how about **“Hello”**?
- **(p. 97) *Sometimes a genuine extension seems to occur when no similarity between stimuli expressible in the terms of physical science can be demonstrated***

Some VB quotations on abstraction

- **(p. 107)** ***The verbal community...reinforces responses in the presence of a chosen stimulus property and fails to reinforce, or perhaps even punishes, responses evoked by unspecified properties. As a result, the response tends to be made only in the presence of the chosen property***
- **(p. 109)** ***Abstraction is a peculiarly verbal process because a nonverbal environment cannot provide the necessary restricted contingency***
- **(p. 110)** ***...all tacts are pinned down, if they are pinned down at all,*** **via** ***the same process. The verbal response*** **chair** ***is as abstract as*** **red**

Some VB quotations on private events

- **(p. 130)** ***In setting up the kind of verbal operant called the tact, the verbal community characteristically reinforces a given response in the presence of a given stimulus. This can be done only if the stimulus acts upon both speaker and reinforcing community. A private stimulus cannot satisfy these conditions***
- ***(p. 134) The contingencies which establish verbal behavior under the control of private stimuli are...defective***
- **(p. 140)** ***It is only through the gradual growth of a verbal community that the individual becomes "conscious"***

THE BEHAVIORAL AND BRAIN SCIENCES (1984) 7, 547–581
Printed in the United States of America

The operational analysis of psychological terms

B. F. Skinner
Department of Psychology and Social Relations, Harvard University, Cambridge, Mass. 02138

Abstract: The major contributions of operationism have been negative, largely because operationists failed to distinguish logical theories of reference from empirical accounts of language. Behaviorism never finished an adequate formulation of verbal reports and therefore could not convincingly embrace subjective terms. But verbal responses to private stimuli can arise as social products through the contingencies of reinforcement arranged by verbal communities.

In analyzing traditional psychological terms, we need to know their stimulus conditions ("finding the referent"), and why each response is controlled by that condition. Consistent reinforcement of verbal responses in the presence of stimuli presupposes stimuli acting upon both the speaker and the reinforcing community, but subjective terms, which apparently are responses to private stimuli, lack this characteristic. Private stimuli are physical, but we cannot account for these verbal responses by pointing to controlling stimuli, and we have not shown how verbal communities can establish and maintain the necessary consistency of reinforcement contingencies.

Verbal responses to private stimuli may be maintained through appropriate reinforcement based on public accompaniments, or through reinforcements accorded responses made to public stimuli, with private cases then occurring by generalization. These contingencies help us understand why private terms have never formed a stable and uniform vocabulary: It is impossible to establish rigorous vocabularies of private stimuli for public use, because differential reinforcement cannot be made contingent upon the property of privacy. The language of private events is anchored in the public practices of the verbal community, which make individuals aware only by differentially reinforcing their verbal responses with respect to their own bodies. The treatment of verbal behavior in terms of such functional relations between verbal responses and stimuli provides a radical behaviorist alternative to the operationism of methodological behaviorists.

Keywords: awareness; behavior, verbal; behaviorism, methodological; behaviorism, radical; operationism; philosophy of psychology; private events; reference; semantics; subjectivity–objectivity; verbal community

Operationism may be defined as the practice of talking about (1) one's observations, (2) the manipulative and calculational procedures involved in making them, (3) the logical and mathematical steps which intervene between earlier and later statements, and (4) *nothing else*. So far, the major contribution has come from the fourth provision and, like it, is negative. We have learned how to avoid troublesome references by showing that they are artifacts which may be variously traced to history, philosophy, linguistics, and so on. No very important positive

the corresponding set of operations" cannot be taken literally, and no similarly explicit but satisfactory statement of the relation is available. Instead, a few roundabout expressions recur with rather tiresome regularity whenever this relation is mentioned: We are told that a concept is to be defined "*in terms of*" certain operations, that propositions are to be "*based upon*" operations, that a term denotes something only when there are "*concrete criteria for its applicability*," that operationism consists in "*referring any concept for its definition to* con-

Different Modes of Access to a Single Stimulus

- Two examples:
  - Geometric solids for a sighted person and for a blind person
  - A toothache for a patient and for a dentist

Some VB quotations on self-awareness

- **(p. 140)** ***It is only through the gradual growth of a verbal community that the individual becomes "conscious"***
- **(p. 314)** ***...the contingencies which generate a response to one's own verbal behavior are unlikely in the absence of social reinforcement. It is because our behavior is important to others that it eventually becomes important to us***

Skinner's four ways by which a public verbal community can create a vocabulary of private events

A reinforcing community with no access to private stimuli may generate verbal behavior with respect to them by basing consequences on

- (1) common public accompaniments
- (2) collateral responses to the private stimuli
- (3) responses related to public stimuli but transferred to private events by virtue of common properties, as in metaphorical or metonymical extension
- (4) responses eventually made to private stimuli that are similar except in magnitude to private stimuli otherwise accompanied by public manifestations

How the public verbal community creates vocabularies of private events

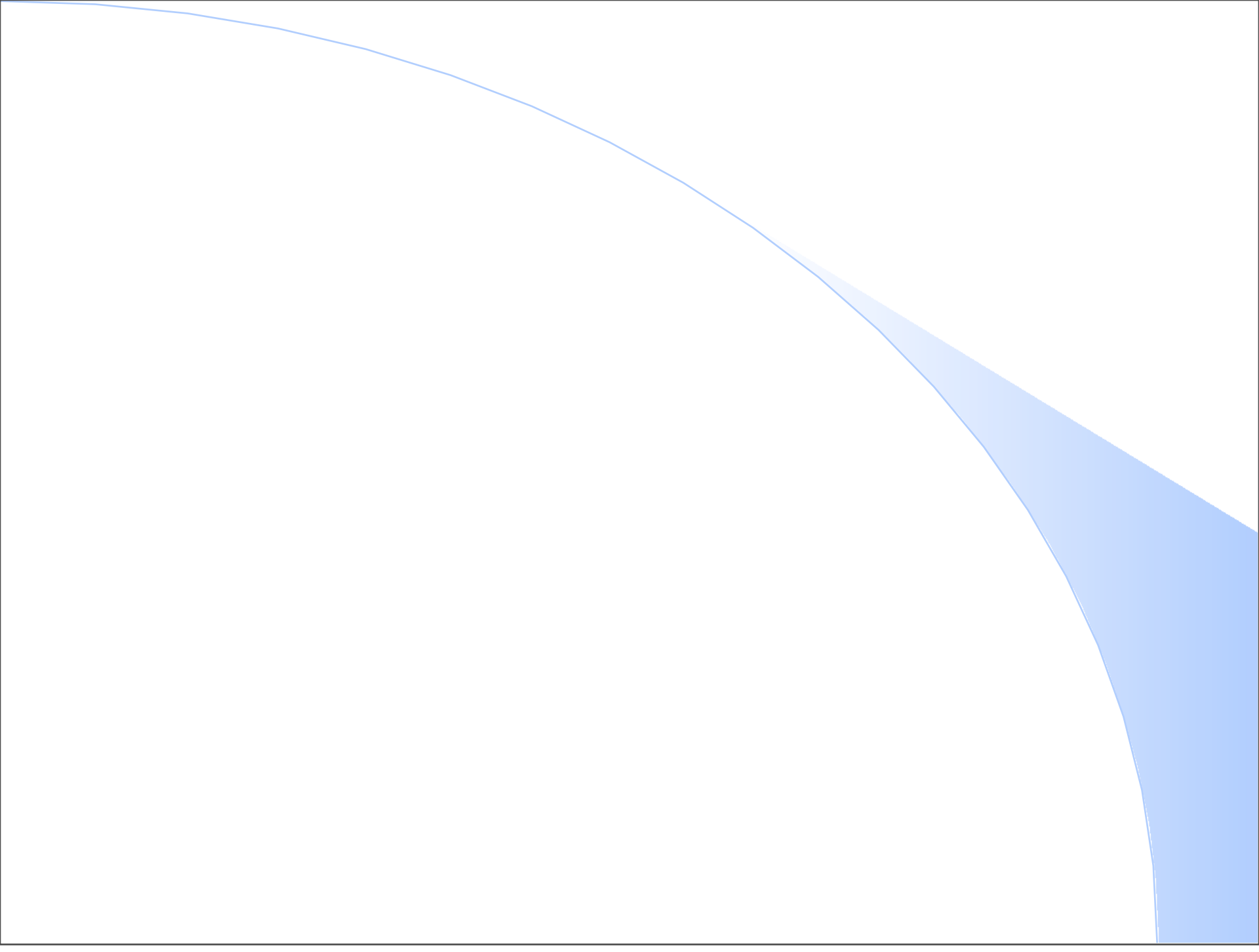
- It is important to remember that this is not about showing or telling, though both may enter into the learning of names. Rather, it is about the consequences the verbal community brings to bear on the verbal behavior of those members who are acquiring a vocabulary of private events
- Consider the development of the vocabularies of “I remember,” “I forgot,” and “I never knew.” Developmental psychologies look at the order in and the ages at which these are learned in natural environments, but it might be more profitable to examine how they might be taught
- Caregivers often know what children have or have not had experience with, so it is actually fairly straightforward to arrange appropriate contingencies

The Tact and Naming

- **Naming:** a higher-order class that involves arbitrary stimulus classes (things or events with particular names) and corresponding arbitrary verbal topographies (the words that serve as their names) in a bi-directional relationship.
- **Components of Naming:**
  - Tacting
  - Echoic behavior
  - Listener behavior

A VB quotation on emotional effects and conditioned responding

- **(p. 158) *...concrete terms usually have greater emotional effects than abstract. The difference is that the concrete term, in the sense of a response under the control of a particular stimulus, is more likely to coincide with emotionally effective stimuli. The abstract term, being controlled by a property of a large class of events, is not likely to be affected by any other event frequently correlated with that property. For the same reason, the concrete term is likely to generate "conditioned seeing"--that is, to evoke "images"***
  - Emotional Responses: From semantic conditioning to equivalence classes



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The Mand and Manding

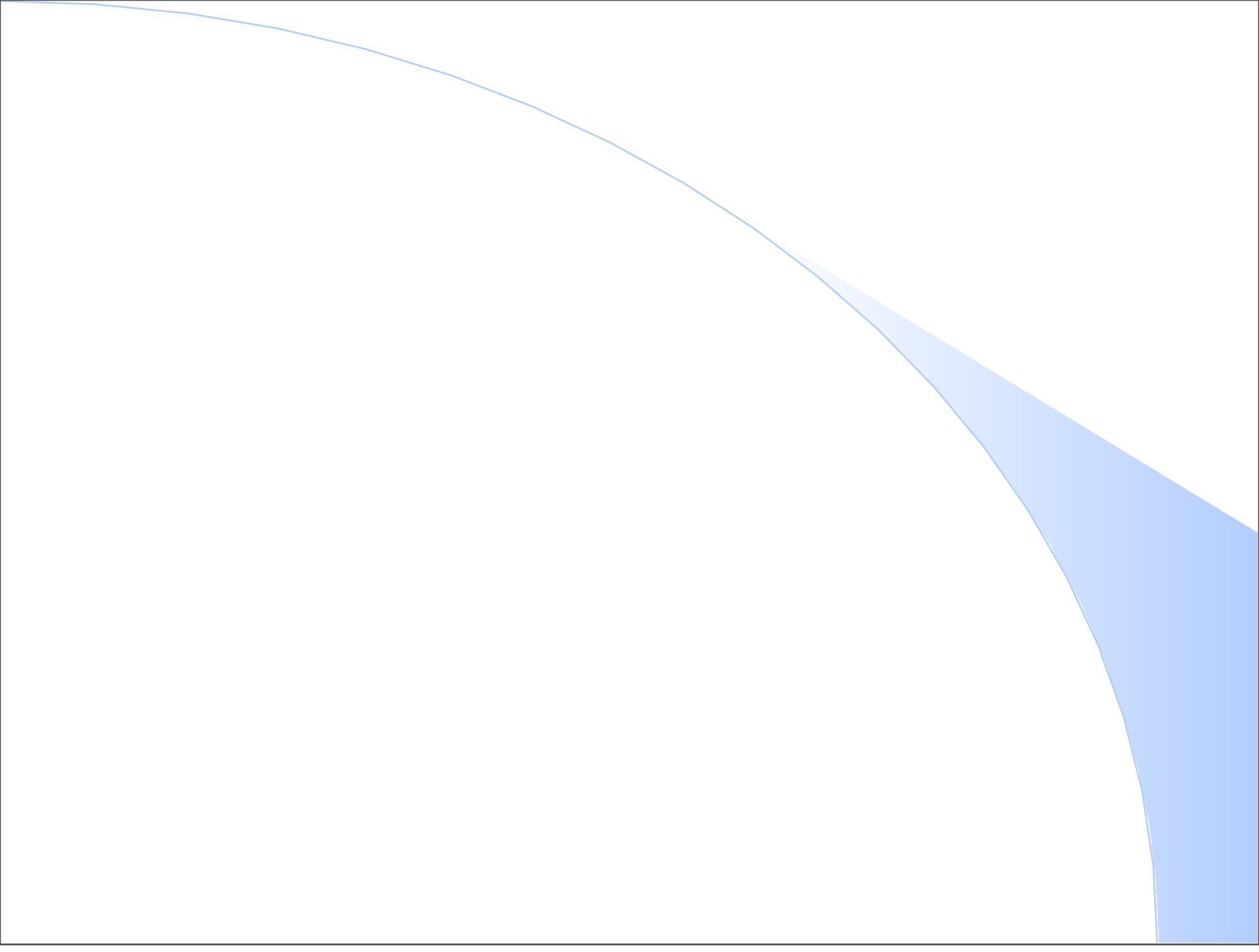
- A verbal response that specifies its reinforcer. In human verbal behavior, manding is usually a higher-order class, in the sense that newly acquired verbal responses can be incorporated into novel mands

Some VB quotations on manding

- **(p. 36)** ***A mand is characterized by the unique relationship between the form of the response and the reinforcement characteristically received in a given verbal community. It is sometimes convenient to refer to this relation by saying that a mand 'specifies' its reinforcement***
- **(p. 36)** ***A mand is a type of verbal operant singled out by its controlling variables. It is not a formal unit of analysis. No response can be said to be a mand from its form alone***

Some VB quotations on manding

- **(p. 46)** ***An example of extended stimulus control is seen when people mand the behavior of dolls, small babies, and untrained animals. These "listeners" cannot possibly reinforce the behavior in characteristic fashion***
- **(p. 48)** ***The speaker appears to create new mands on the analogy of old ones. Having effectively manded bread and butter, he goes on to mand the jam, even though he has never obtained jam before in this way***



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Intraverbal Behavior

- Verbal responses occasioned by verbal stimuli, where the relation between stimulus and response is an arbitrary one established by the verbal community. Intraverbal behavior is chaining as it occurs in verbal behavior. Either the speaker or someone else may provide verbal stimuli

Chapter 14

THE PROBLEM OF SERIAL ORDER IN BEHAVIOR (1951)

(By K. S. Lashley. From the Department of Psychology, Harvard University and the Yerkes Laboratories of Primate Biology. In Jeffress, L. A. (Ed.) *Cerebral mechanisms in behavior*. 1951. Pp.112-136. Reprinted with permission from the California Institute of Technology.)

The previous speakers have approached our common problem by considering the properties of the elementary units of which we believe the cerebral structure to be built up. They have considered the kinds of neural integration of behavior which can be anticipated from those properties. The remaining members of the symposium have in their research been concerned chiefly with the analysis of complex behavior, seeking to derive general principles of neural integration from the infinitely complex products of the

Some VB quotations on intraverbals

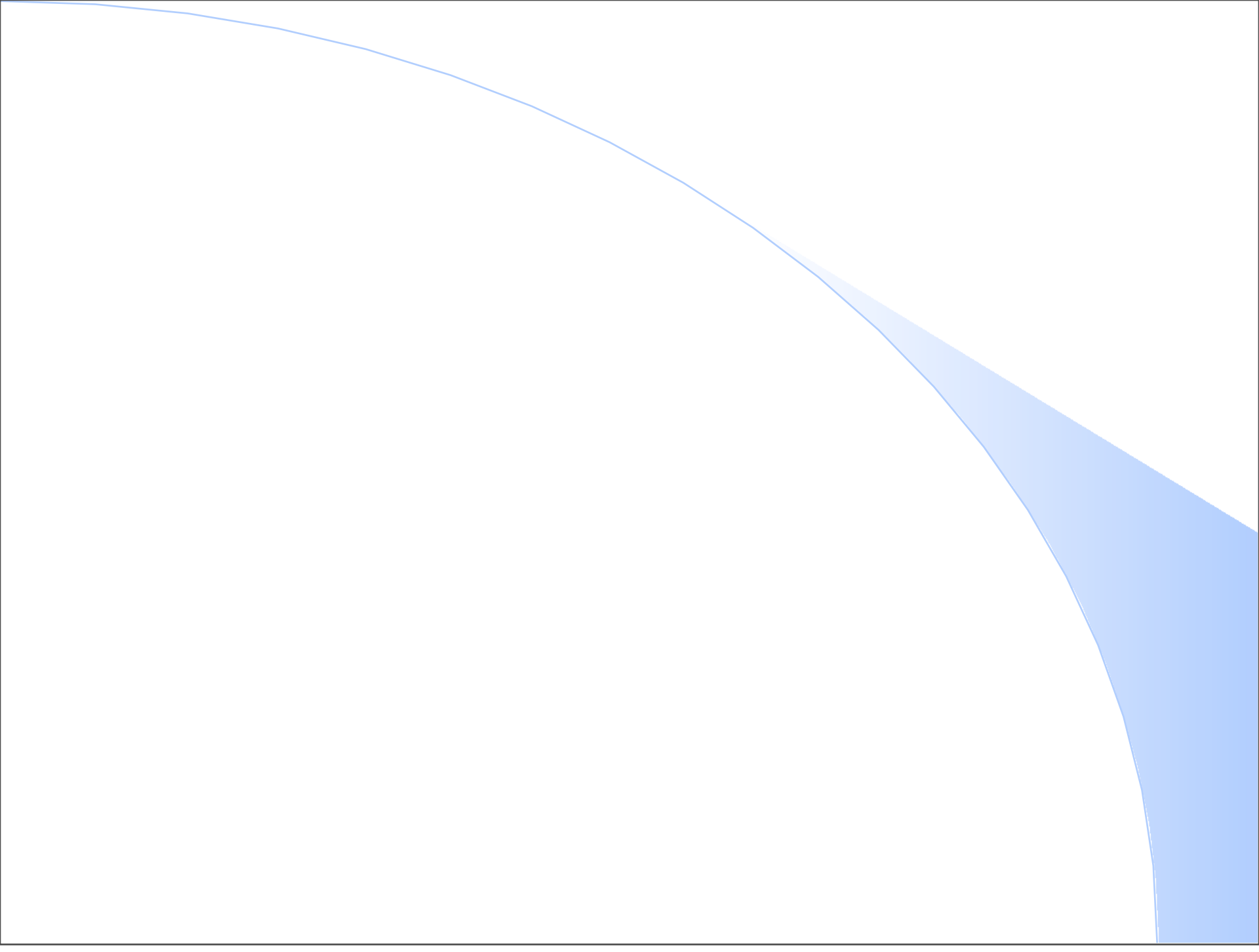
- **(p. 72)** ***Most of the "facts" of history are acquired and retained as intraverbal responses***
- **(p. 74)** ***The intraverbal relations in any adult repertoire are the result of hundreds of thousands of reinforcements under a great variety of inconsistent and often conflicting contingencies. Many different responses are brought under the control of a given stimulus word, and many different stimulus words are placed in control of a single response***

Ideal intraverbals?

- Not usually poems or scripts or other recitations, which include many thematic elements
- Consider some arbitrary sequences:
  - Reciting the alphabet

    There is little logic to the order of the letters (e.g., voiced-voiceless pairs appear in either order: d - t or b - p but f - v or s - z)
  - Counting

    The number names are arbitrary, and only when correspondences are created do numbers begin to become functional (e.g., pointing to objects as one counts them)



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Audiences

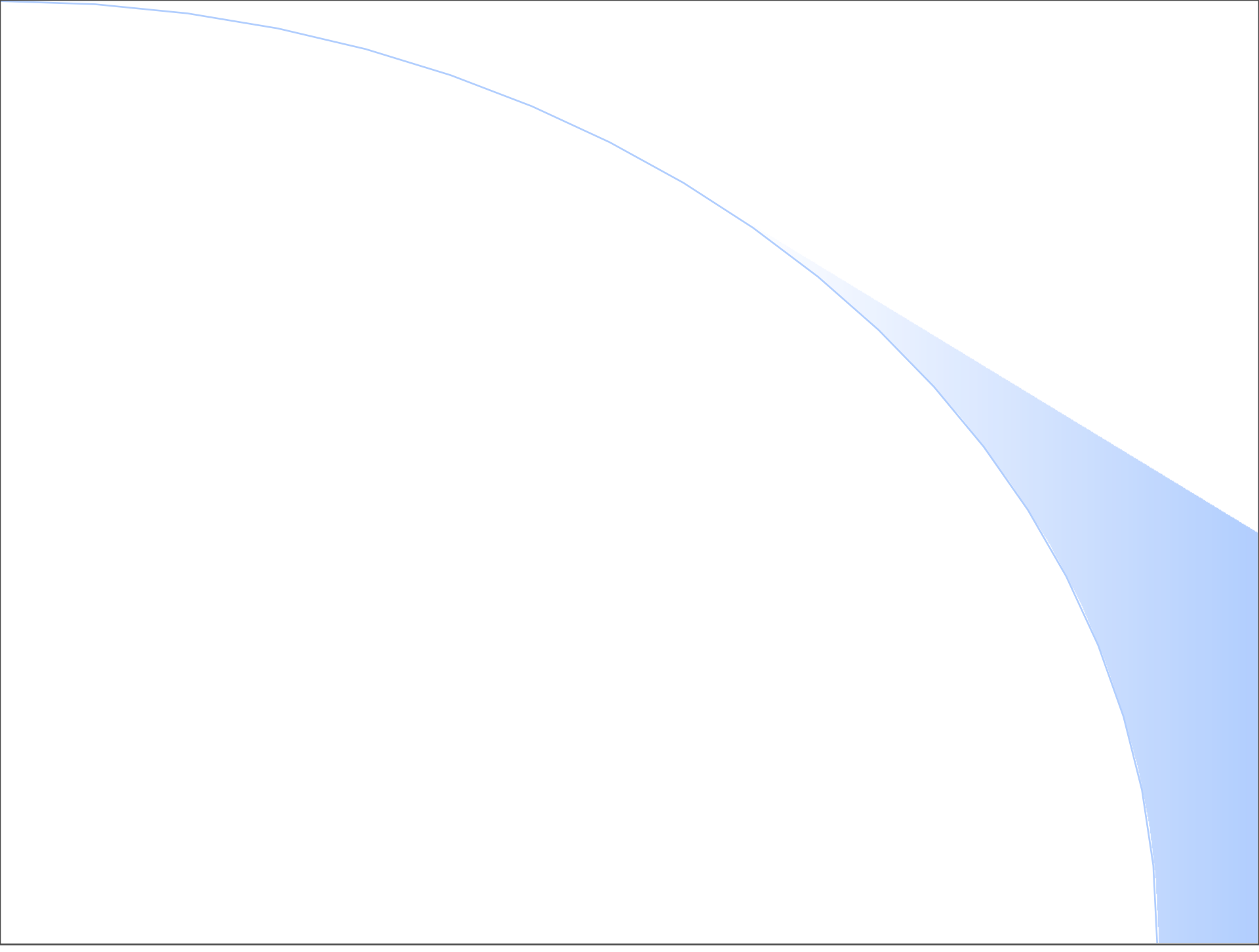
- The discriminative stimuli that set the occasion on which verbal behavior may have consequences. Different audiences may set the occasion for different classes of verbal behavior

Some VB quotations on audiences

- **(p. 172)** ***Verbal behavior usually occurs only in the presence of a listener.... Under conditions of great strength, verbal behavior may be emitted in the absence of a listener***
- **(p. 174)** ***The audience selects one set of responses in preference to another. When there is only one set, we need not appeal to the audience except as the all-or-none determiner of verbal behavior or silence***
- **(p. 176)** ***An effective audience is hard to identify. The presence or absence of a person is not enough***
- **(p. 232)** ***A single response may have different effects upon different audiences***

VB quotations on the listener

- **(p. 277)** ***The listener can be said to understand a speaker if he simply behaves in an appropriate fashion*** **[see also pp. 278 to 280]**
- **(p. 280)** ***One of the principle effects of verbal behavior, then, is the strengthening of corresponding behavior in the listener.... The process is especially important when one is talking to oneself***



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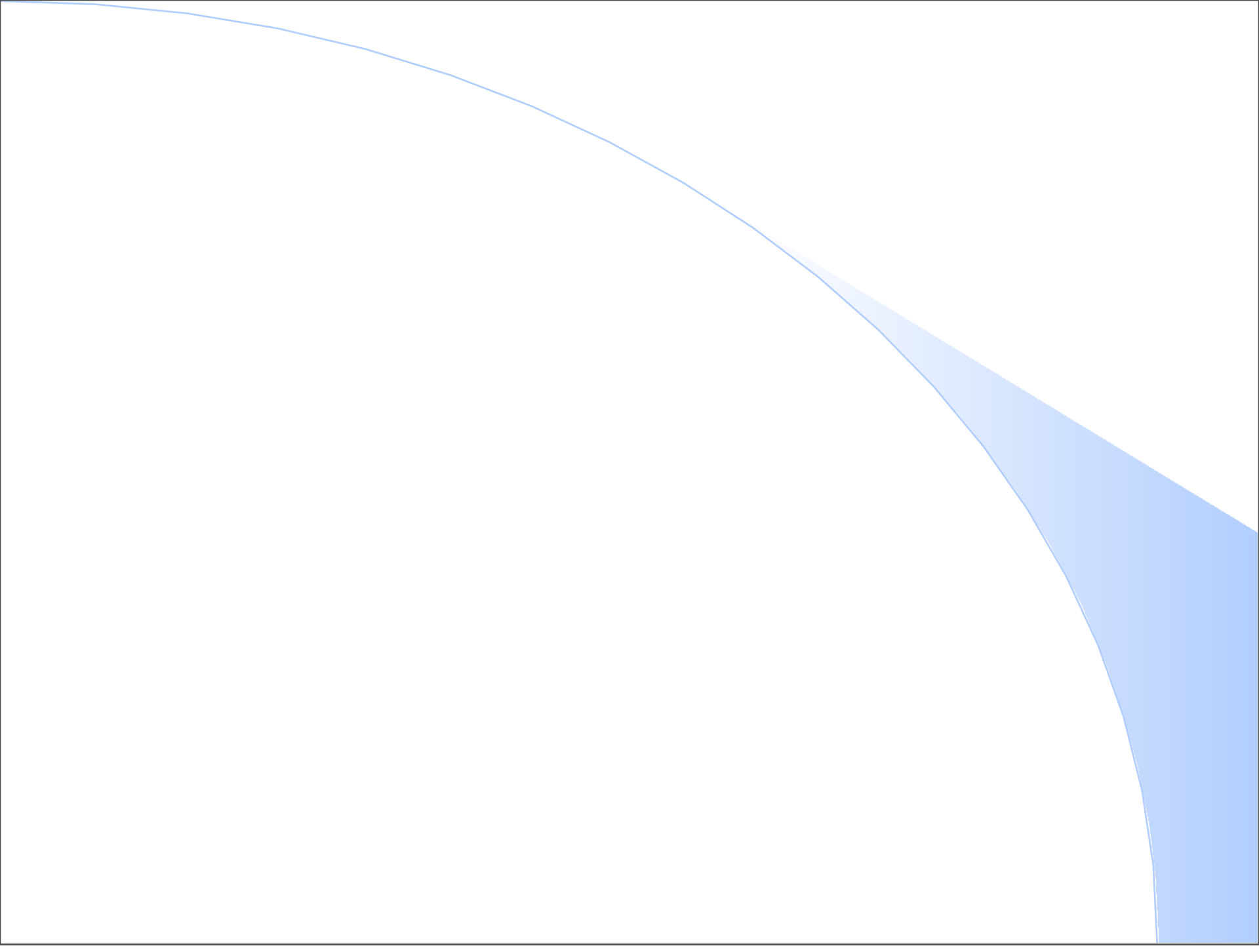
Classes defined by function, not form

- **(p. 186)** ***...we cannot tell from form alone into which class a response falls.*** **Fire** ***may be (1) a mand to a firing squad, (2) a tact to a conflagration, (3) an intraverbal response to the stimulus*** **Ready, aim...,** ***or (4) an echoic or (5) textual response to appropriate verbal stimuli. It is possible that formal properties of the vocal response, especially its intonation, may suggest one type of controlling variable, but an analysis cannot be achieved from such internal evidence alone. In order to classify behavior effectively, we must know the circumstances under which it is emitted***



Tuesday, August 2, 2016

WHAT ARE THE FUNCTIONAL PARTS OF VERBAL BEHAVIOR, WHAT ARE THEY GOOD FOR, AND HOW ARE THEY SHAPED?

Verbal Behavior

- THE FORMAL VERBAL CLASSES
- Echoic Behavior
- Dictation-Taking
- Textual Behavior
- Transcription

- THE TACT AND TACTING
- Naming
- Extensions of the Tact
- Metaphor
- Private Events

- INTRAVERBAL BEHAVIOR
- THE MAND AND MANDING
- AUDIENCES
- Listener Behavior
- COMBINATIONS OF VERBAL PROCESSES
- Multiple Causation
- Autoclitic Processes
- Higher-Order Classes and Adduction
- Verbally Governed Behavior

The Multiple Causation of Verbal Behavior

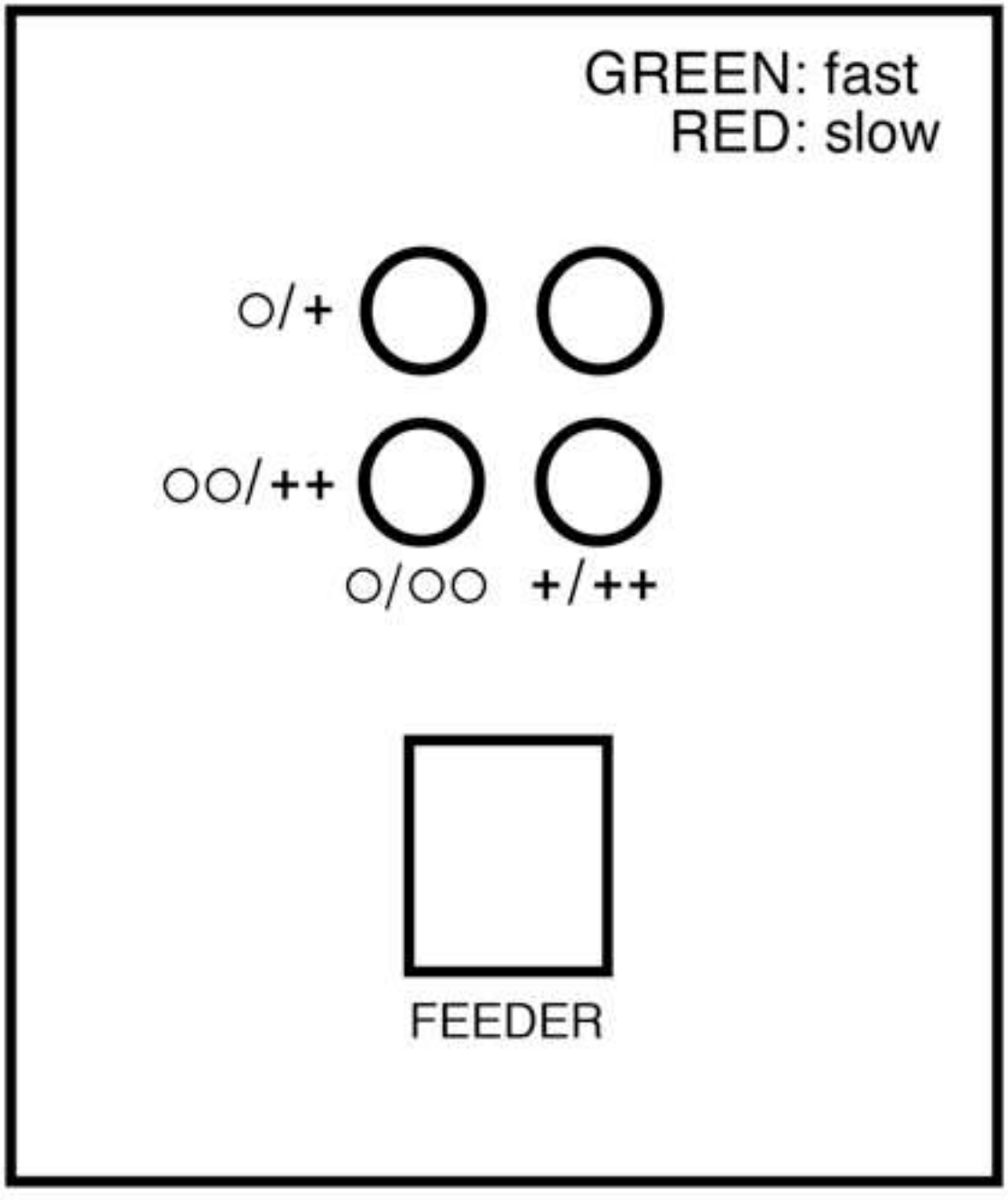
- A ubiquitous property of verbal behavior is its multiple causation. A particular verbal utterance is likely to be determined jointly by nonverbal discriminative stimuli, prior verbal responses, possible reinforcing or aversive consequences, the nature of the listener, and the condition of the speaker (including establishing operations).
- In the technical vocabulary of verbal behavior, the effects of these variables might be treated as interactions of tacts, intraverbals, mands, audiences, and autoclitics

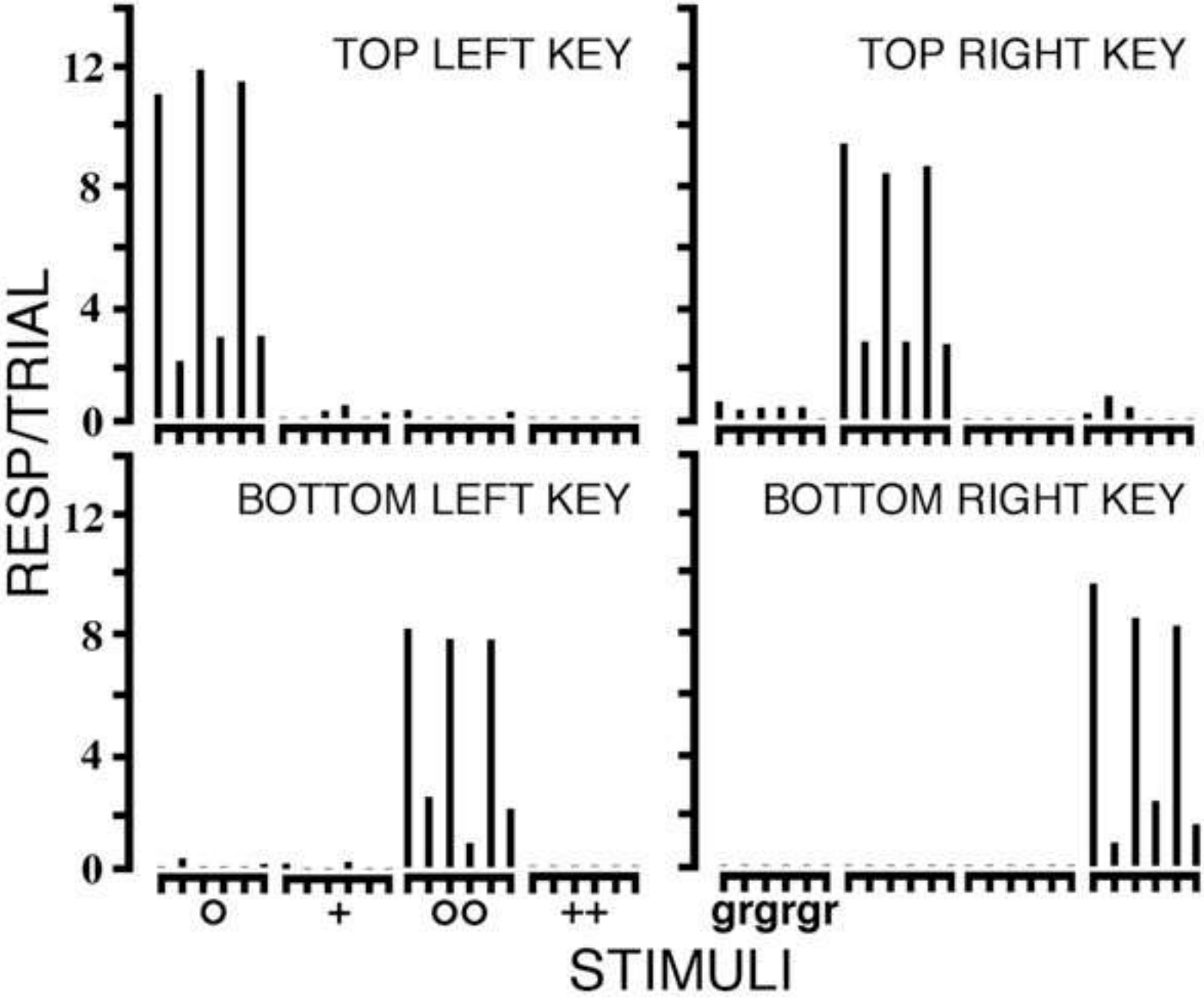
Some VB quotations

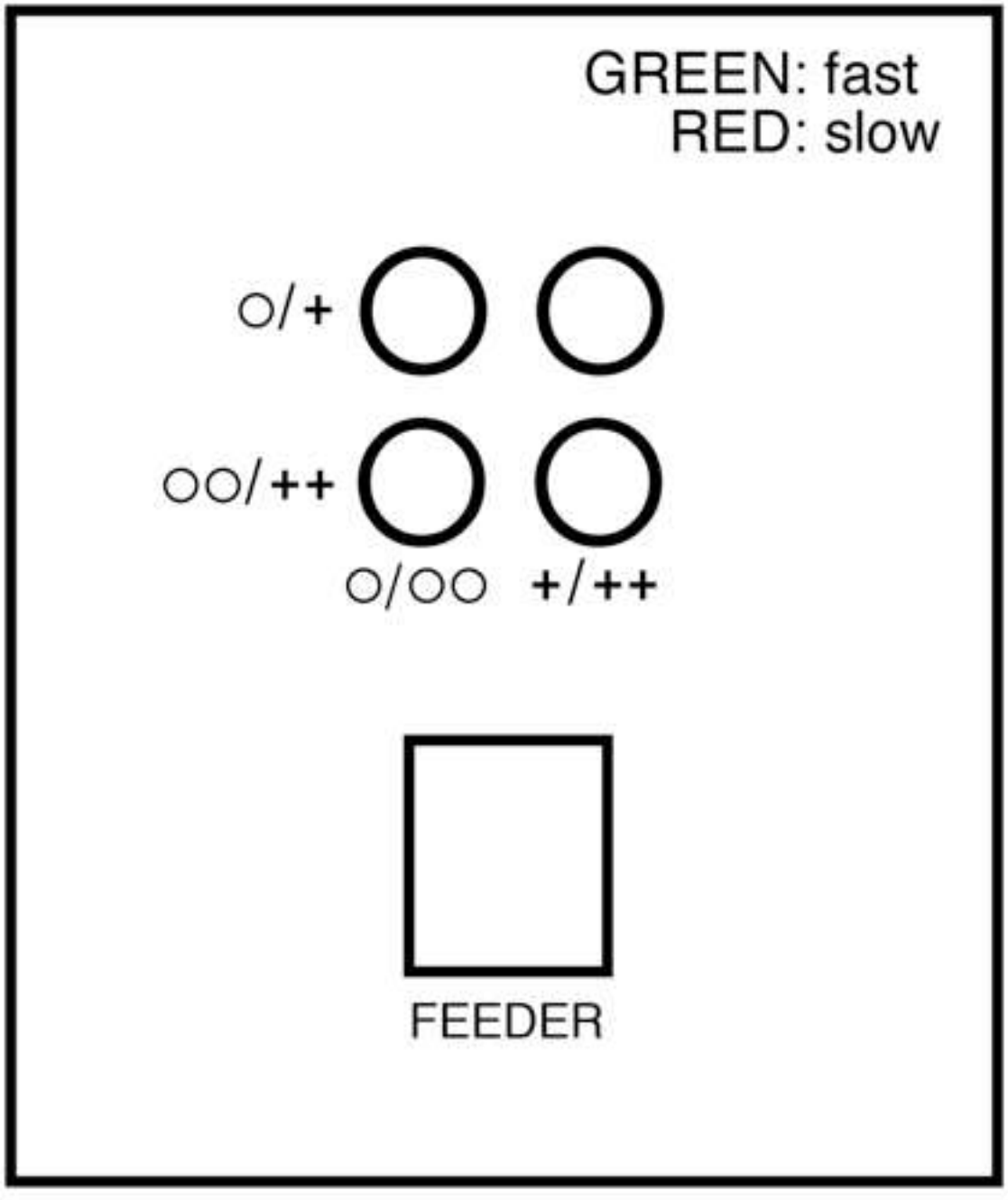
- **(p. 312)** ***The verbal operant is a lively unit***
- **(p. 403)** ***Much of the behavior emitted upon any occasion "just grows"---it springs from the current changing environment and from other verbal behavior in progress***
- **(p. 313)** ***The speaker...is also a locus---a place in which a number of variables come together in a unique confluence to yield an equally unique achievement***

Adduction

- Sometimes the separate variables that are the multiple causes of a given response come together in a novel combination to produce novel behavior, as when two or more newly learned words appear together for the first time in a sentence a child has never uttered before. The phenomenon is called adduction


GREEN: fast
RED: slow
○/+
○○/++
○/○○
+/++
FEEDER


TOP LEFT KEY
TOP RIGHT KEY
BOTTOM LEFT KEY
BOTTOM RIGHT KEY
RESP/TRIAL
12
8
4
0
O
+
OO
++
grgrgr
STIMULI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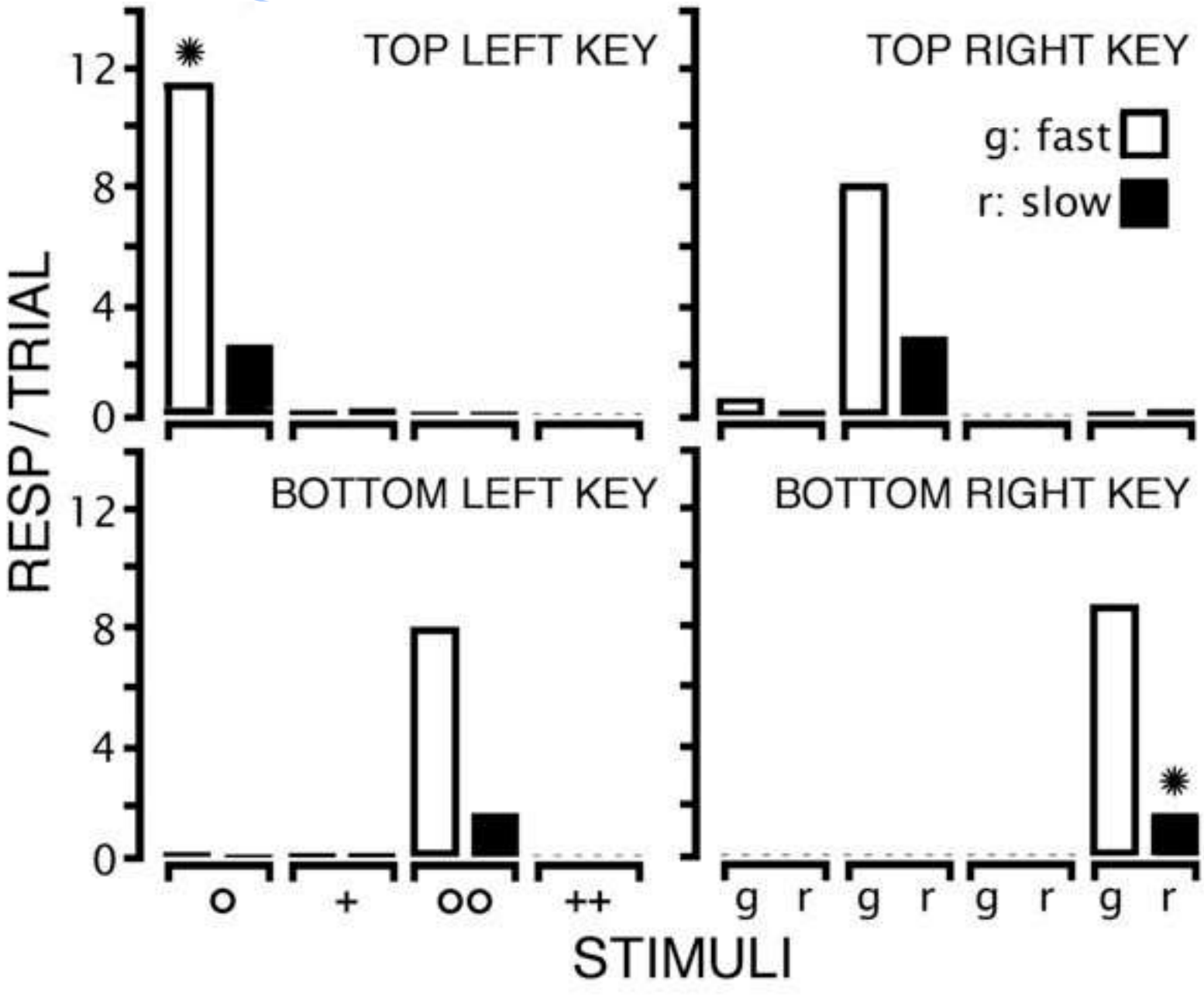

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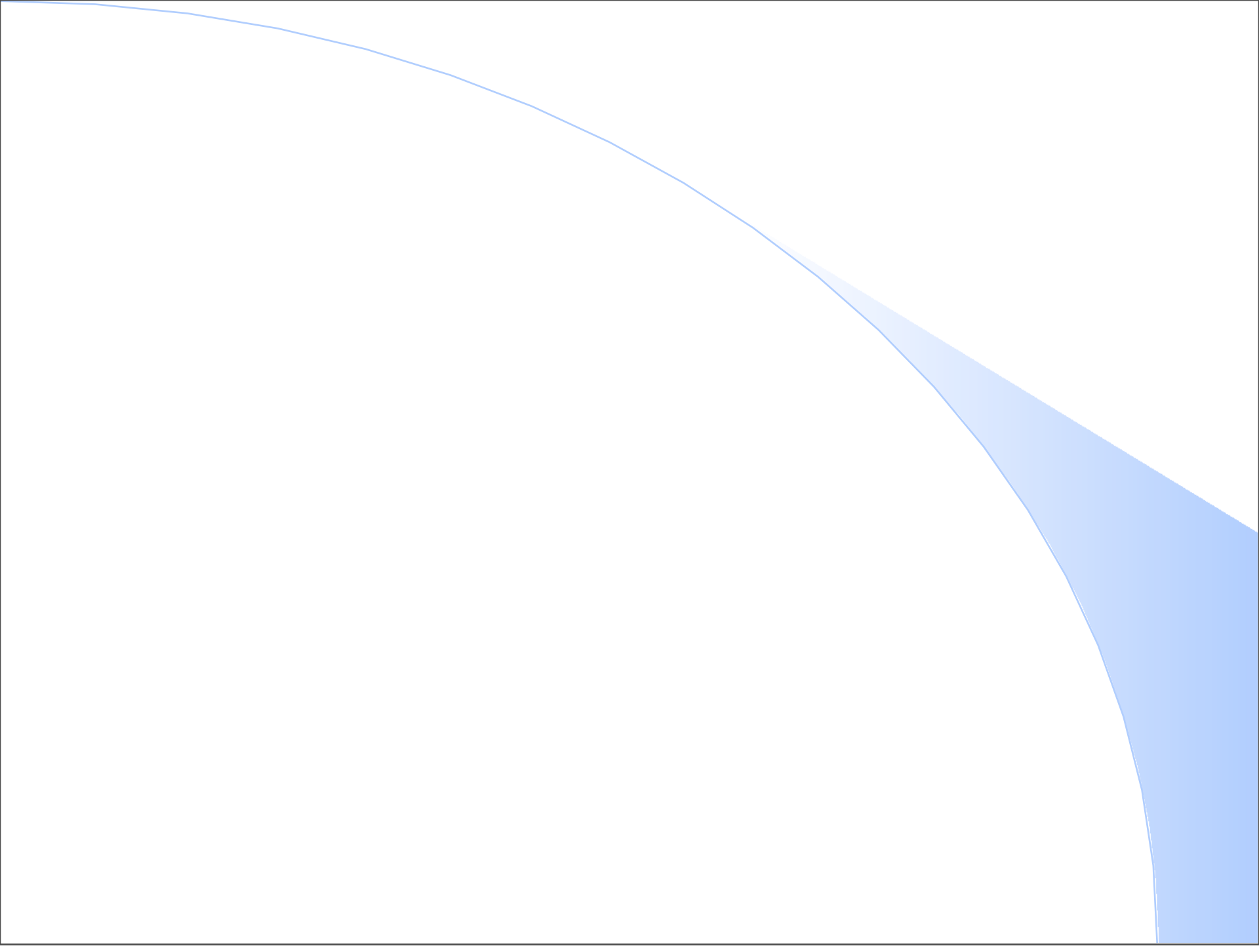
And describe the singular-plural synthesis expt without figures



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Autoclitic Processes

- A unit of verbal behavior that depends on other verbal behavior for its occurrence and that modifies the effects of that other verbal behavior on the listener. *Relational autoclitics* involve verbal units coordinated with other units in such a way that they cannot stand alone, as when grammatical tenses depend on temporal features of events. *Descriptive autoclitics* involve discriminations of one's own behavior, as when the word “not” depends on a mismatch between what one is inclined to say and the appropriateness of saying it

Some VB quotations on autoclitics

- **(p. 312)** ***The verbal operants we have examined may be said to be the raw material out of which sustained verbal behavior is manufactured***
- **(p. 315)** ***The term "autoclitic" is intended to suggest behavior which is based upon or depends upon other verbal behavior***
- **(p. 313)** ***Part of the behavior of an organism becomes in turn one of the variables controlling another part***
- **(p. 330)** ***In the absence of any other verbal behavior whatsoever autoclitics cannot occur***

Some VB quotations on autoclitics

- **(p. 317)** ***Negative autoclitics qualify or cancel the response which they accompany but imply that the response is strong for some reason***

  Consider the Wayne's World "Not!"

- **(p. 332)** ***The manipulation of verbal behavior, particularly the grouping and ordering of responses, is also autoclitic***

  Consider grammatical structure and the distinction between descriptive and relational autoclitics

- **(p. 332)** ***Responses cannot be grouped or ordered until they have occurred or are about to occur***

Some VB quotations on autoclitic frames

- **(p. 336)** ***Something less than full-fledged relational autoclitic behavior is involved when partially conditioned autoclitic "frames" combine with responses appropriate to a particular situation***
- **(p. 346)** ***Some sentences are standard responses to situations comparable to well-memorized verses or maxims or oaths. Others are nearly complete skeletal "frames" upon which an exceptional response or two may be hung***

The Behavior Analyst 1981, 4, 1-7 No. 1 (Spring)

HOW TO DISCOVER WHAT YOU HAVE TO SAY— A TALK TO STUDENTS

B. F. Skinner
Harvard University

My title will serve as an outline. It begins with "How to," and this is a "How to" talk. It is about a problem we all face, and the solution I propose is an example about verbal self-management, using my *Verbal Behavior* (1957) as the basis of a technology. At issue is how we can manage our own verbal behavior more effectively. (I may note in passing that psycholinguistics, a very different kind of analysis, largely structural and developmental, has given rise to no comparable technology, in part because it so often devotes itself to the listener rather than the speaker.)

Verbal behavior begins almost always in spoken form. Even when we write, we usually speak first, either overtly or covertly. What goes down on paper is not express ideas but are the ideas themselves. They are what "occur to us" as we consider a set of circumstances. If I have forgotten the key to my house and "it occurs to me" to look under the mat, it is not an idea that has occurred to me but the behavior of looking, and it occurs because under similar circumstances I have found a key under the mat. What verbal responses "express" are not preverbal ideas but the past history and present circumstances of the speaker. But how are we to arrive at the most effective expression? How can we behave verbally in a way that is most relevant to a problem at hand?

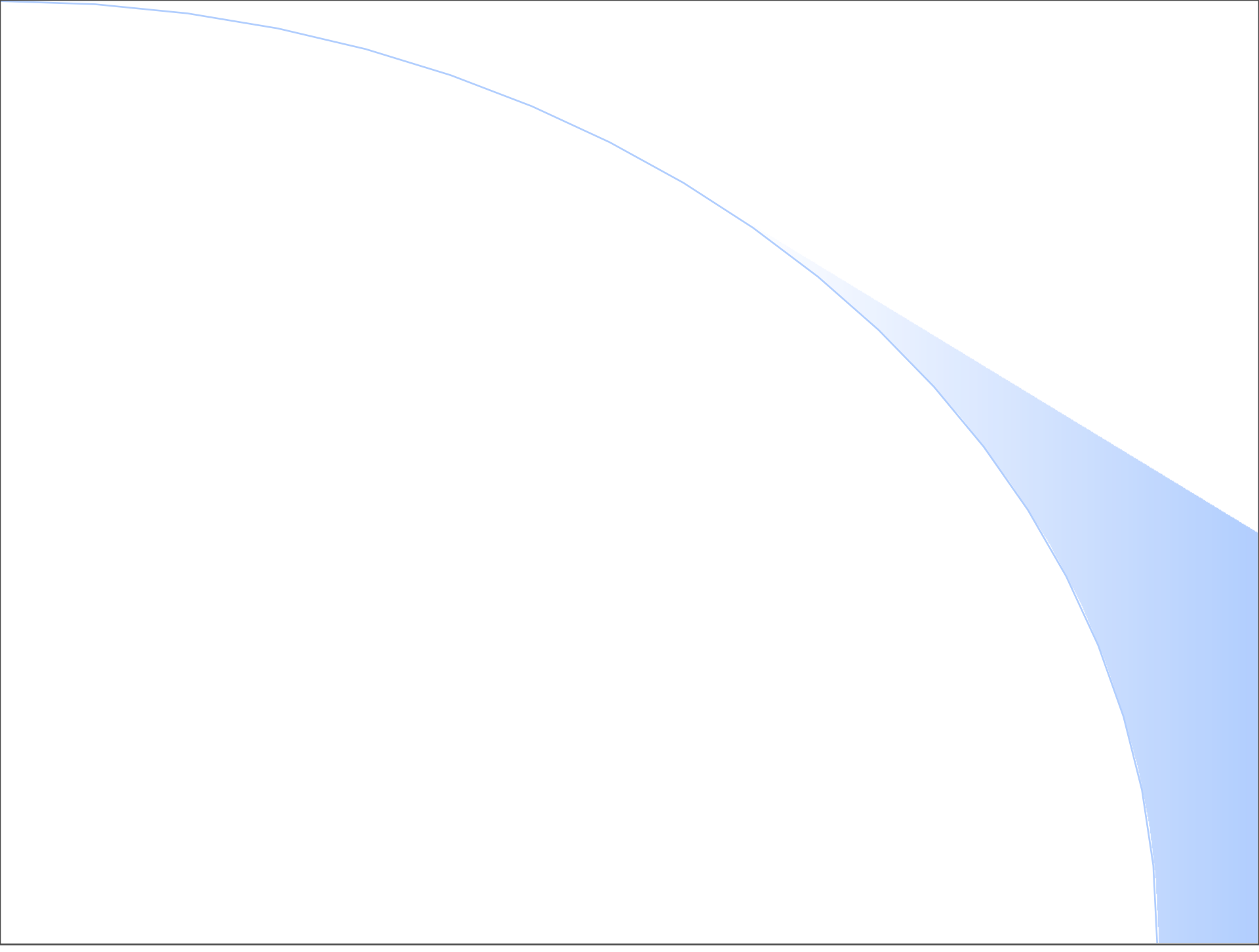
It is hard to give a "how to" talk without posing as an authority. I hasten to say that I know that I could write better

Some VB quotations on constructed verbal responses

- **(p. 423)** ***Mathematics is largely concerned with verbal behavior constructed by counting or by derivative processes***
- **(p. 426)** ***If we have put something in one of two boxes labeled A and B and as the result of looking in B we say*** **It is not in B**, ***we can also construct the response*** **It is in A.** ***This has the form of a complex tact, such as might be emitted after looking in A, but it is reached by construction***

A VB quotation about science

- **(p. 428)** ***An important part of scientific practice is the evaluation of the probability that a verbal response is "right" or "true"---that it may be acted upon successfully***



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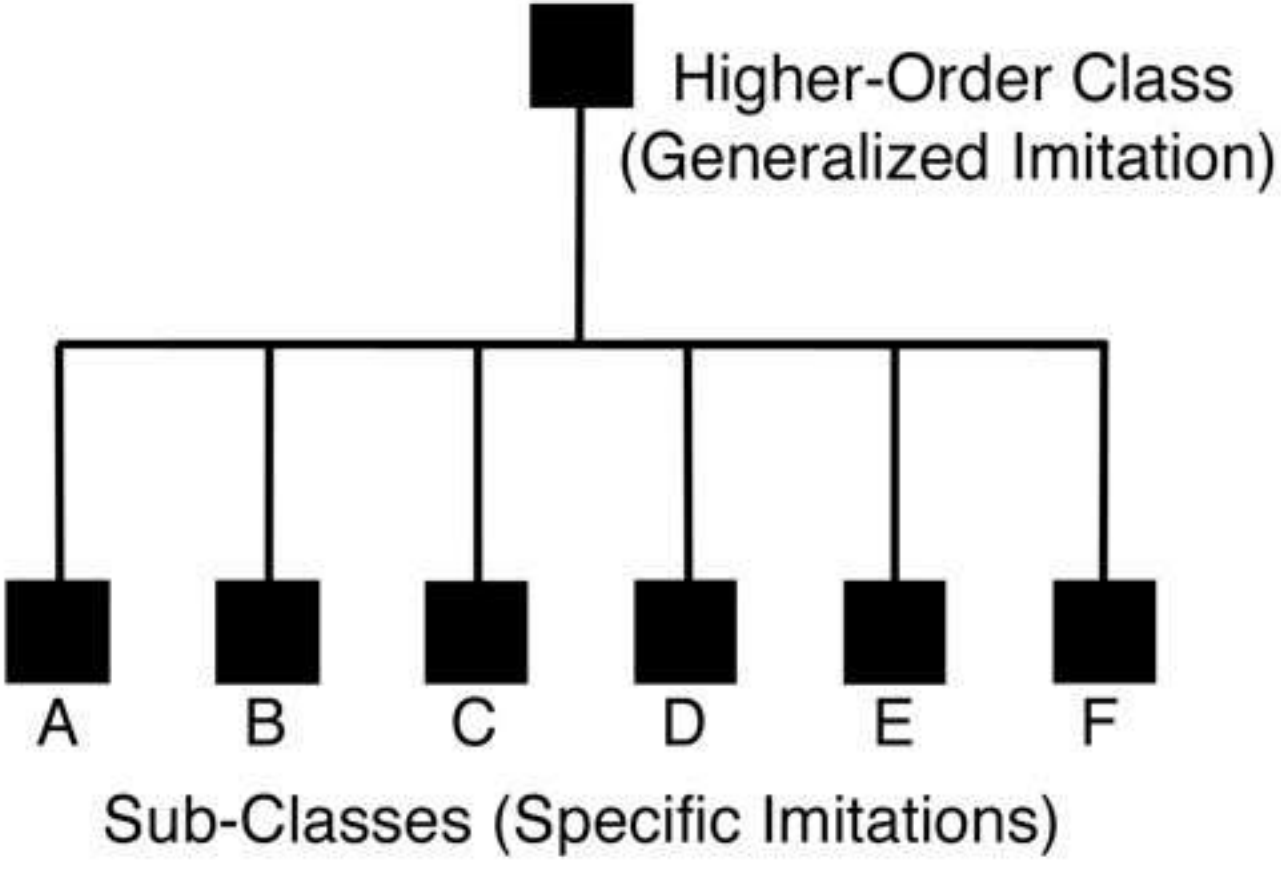
Higher-Order Classes of Behavior

- A class that includes within it other classes that can themselves function as operant classes (as when generalized imitation includes all component imitations that could be separately reinforced as subclasses). A higher-order class is sometimes called a generalized class, in the sense that contingencies arranged for some subclasses within it generalize to all the others. Generalized matching and verbally governed behavior are examples of higher-order classes


Higher-Order Class
(Generalized Imitation)
A
B
C
D
E
F
Sub-Classes (Specific Imitations)

JOURNAL OF THE EXPERIMENTAL ANALYSIS OF BEHAVIOR 1996, 65, 185–241 NUMBER 1 (JANUARY)

ON THE ORIGINS OF NAMING AND OTHER SYMBOLIC BEHAVIOR

PAULINE J. HORNE AND C. FERGUS LOWE

UNIVERSITY OF WALES

We identify *naming* as the basic unit of verbal behavior, describe the conditions under which it is learned, and outline its crucial role in the development of stimulus classes and, hence, of symbolic behavior. Drawing upon B. F. Skinner's functional analysis and the theoretical work of G. H. Mead and L. S. Vygotsky, we chart how a child, through learning listener behavior and then echoic responding, learns bidirectional relations between classes of objects or events and his or her own speaker-listener behavior, thus acquiring naming—a higher order behavioral relation. Once established, the bidirectionality incorporated in naming extends across behavior classes such as those identified by Skinner as the *mand*, *tact*, and *intraverbal* so that each becomes a variant of the name relation. We indicate how our account informs the specification of rule-governed behavior and provides the basis for an experimental analysis of symbolic behavior. Furthermore, because naming is both evoked by, and itself evokes, *classes* of events it brings about new or *emergent* behavior such as that reported in studies of stimulus equivalence. This account is supported by data from a wide range of match-to-sample studies that also provide evidence that stimulus equivalence in humans is not a unitary phenomenon but the outcome of a number of different types of naming behavior.

Key words: naming, verbal behavior, language, symbolic behavior, stimulus equivalence, listener behavior, rule governance, speech for self, consciousness, match to sample, children

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Within behavior analysis in recent years there has been an upsurge of interest in the study of human behavior in general and, more particularly, in those complex behavioral phenomena that many previously considered to be the exclusive concern of cognitive psychology. Language, or verbal behavior, and its interactions with other behavior are now at the center of a great deal of research, and it is increasingly evident that behavior analysts wish to reclaim the high ground of behavioral complexity and deal with issues such as word meaning, semantic relations, and symbolic behavior (e.g., Catania, 1992, pp. observed, it has proved to be enormously difficult for the various approaches within psychology and other disciplines to define what a word or a name is and how naming differs from other forms of behavior (see Quine, 1960; Terrace, 1985). Within cognitive psychology, for example, Harnad (1990) has noted that a flaw in the dominant paradigm, in which "the mind is a symbolic system and cognition is symbol manipulation" (p. 336; see also Fodor, 1975), is that it has a "symbol grounding problem" (p. 335; see also Searle, 1980): That is, there is no way of relating the symbols in the system to the real world. In

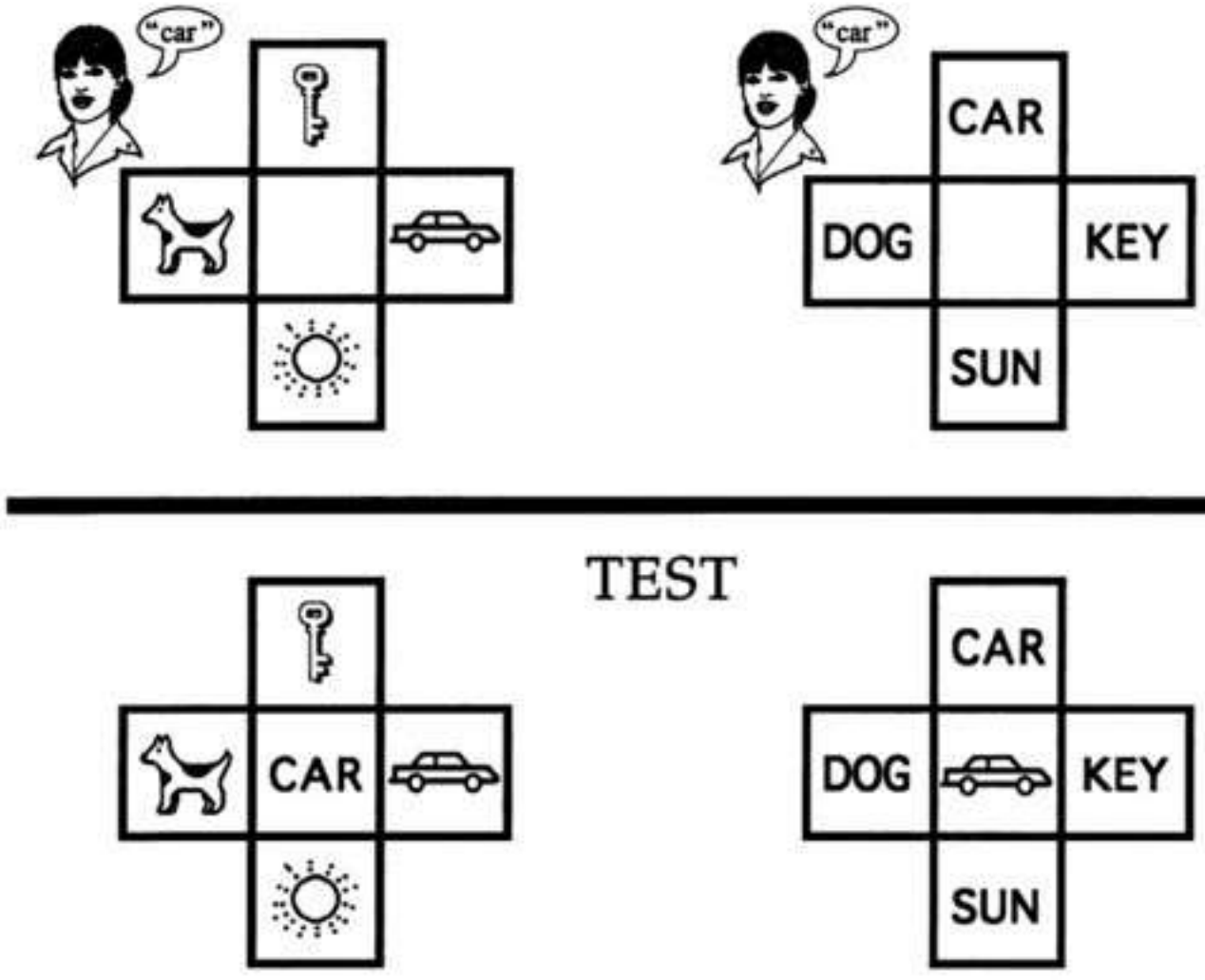


Fig. 1. An example of a match-to-sample procedure (see Sidman, 1971). This shows a five-key response panel; during training (top) the sample stimuli are dictated words and the comparison stimuli are visual stimuli (pictures or words). At the start of each trial, the sample (e.g., the dictated word "car") is presented via tape recorder; touching the center key then brings on the comparison stimuli on the outer keys. Reinforcers are delivered for selecting the stimulus that corresponds to the sample (e.g., the picture of a car or the printed word CAR). In test trials (bottom) the printed words (e.g., CAR) or the picture (e.g., of a car) are presented as samples. Stimulus equivalence is demonstrated when, in the absence of reinforcement, the corresponding comparison picture is selected when the printed word is the sample, and vice versa.

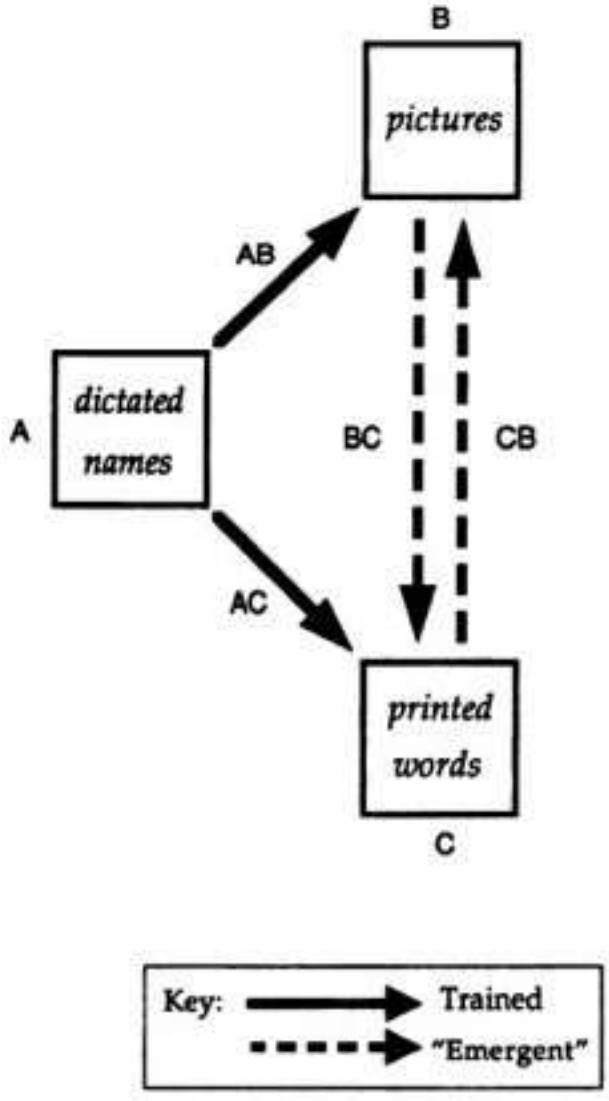


Fig. 2. A schematic representation of Sidman's (1971) equivalence paradigm. The arrows point from sample to comparison stimuli. The solid arrows represent conditional relations (AB and AC) that were explicitly taught. Broken arrows represent conditional relations (BC and CB) that were tested for after the others had been explicitly taught.

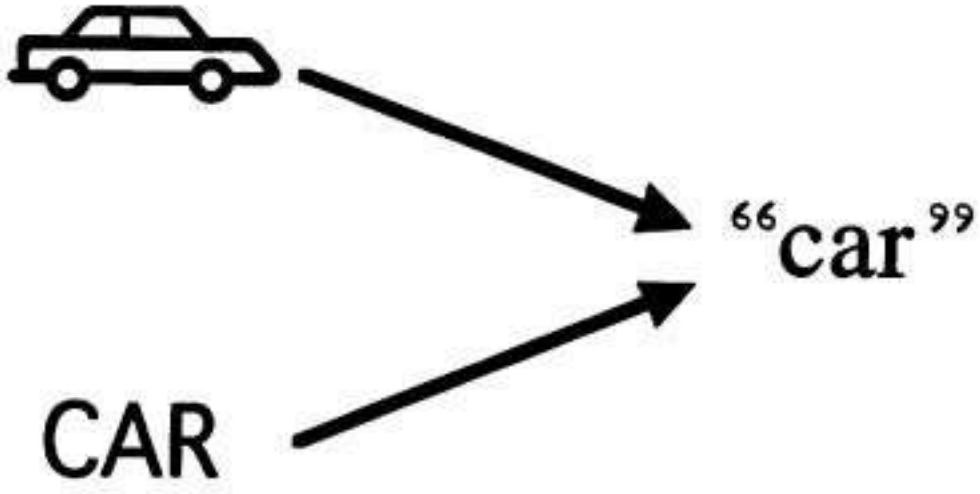


Fig. 3. The tact relation (Skinner, 1957) occurs when a response of a given form (e.g., saying "car") is evoked in the presence of a particular object (e.g., a picture of a car). According to Skinner's account, if the stimulus that evokes the response (e.g., "car") is written or printed (e.g., the printed word CAR) then, strictly speaking, the verbal relation is a *textual* rather than a tact (although this distinction is not easy to sustain because, e.g., a picture may also be drawn or printed). When, as in the figure, the picture and printed word both evoke the same vocal response (i.e., "car"), this is termed *functional equivalence.*

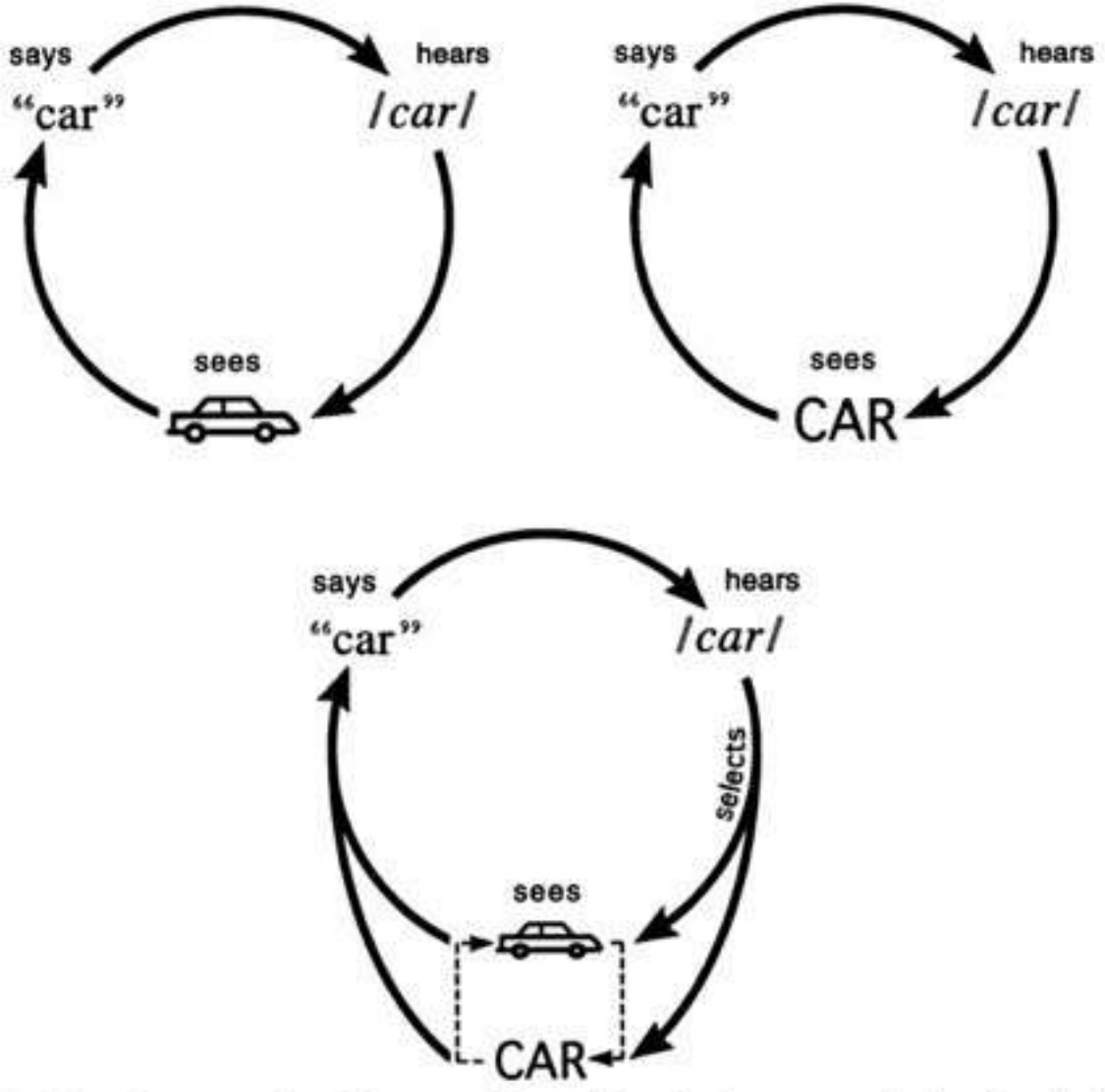


Fig. 4. Schematic representation of the name relation and the role of common naming in auditory-visual match to sample. The name relation involves speakers responding as listeners to their own speaking and is shown here (e.g., top left) as a circular relation between seeing an object (picture of a car), saying ("car"), hearing their own utterance (*/car/*), and seeing or otherwise orienting to the object again. During training on match to sample (cf. Sidman, 1971), shown in the upper displays, when the subject hears the auditory sample stimulus (*/car/*), she echoes it (saying "car") in the presence of the corresponding visual comparison (picture of a car or printed word CAR), and a common name is thereby established. During subsequent visual-visual test trials (bottom), seeing either the picture of a car or the printed word CAR as the sample evokes the saying of "car" and the hearing of */car/*, which in turn occasions selecting either the corresponding picture or printed word, whichever is available as comparison.

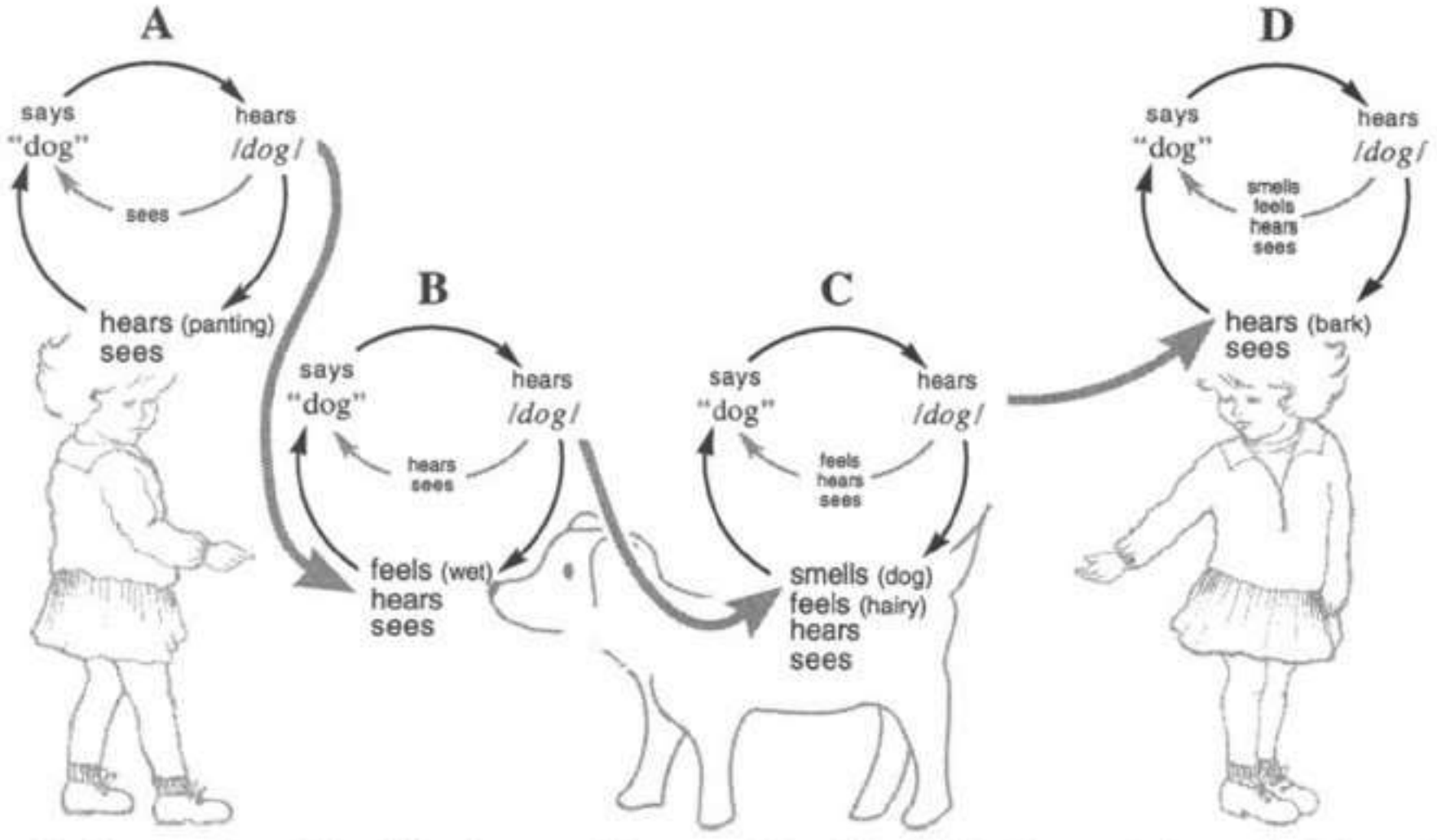


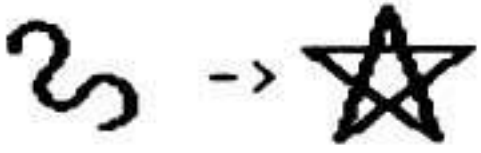
Fig. 11. Ongoing multimodal development of the name relation: The child in this example has previously learned to say "dog" when seeing pictures of dogs and toy dogs. She next learns to say "dog" also when she sees a real dog; sees it move and hears it pant (A), touches its wet nose (B), pats its back, smells and feels its coat (C), and hears it bark (D). The name relation may now be evoked by any one, or some combination of, these new stimuli. In addition (as indicated by the inner gray arrows of name relations A, B, C and D), the auditory stimulus */dog/* comes to occasion conditioned seeing, feeling, smelling, and hearing of dogs, which may, in turn, evoke saying "dog" and so on.

TRANSFER OF FUNCTION

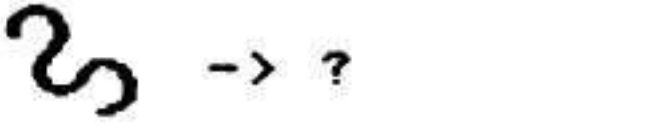
a. Establish rate difference

 SLOW  FAST

b. Establish arbitrary matching

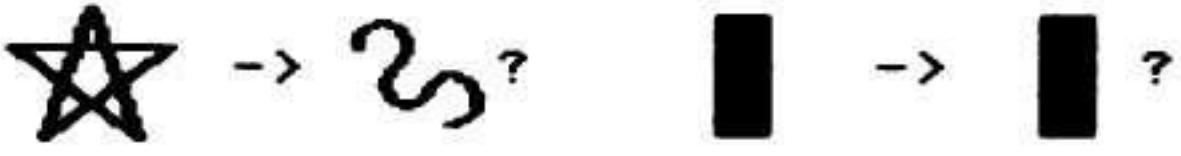


c. Test for transfer (SLOW or FAST?)



d. Test for symmetry, reflexivity

e.g.,:



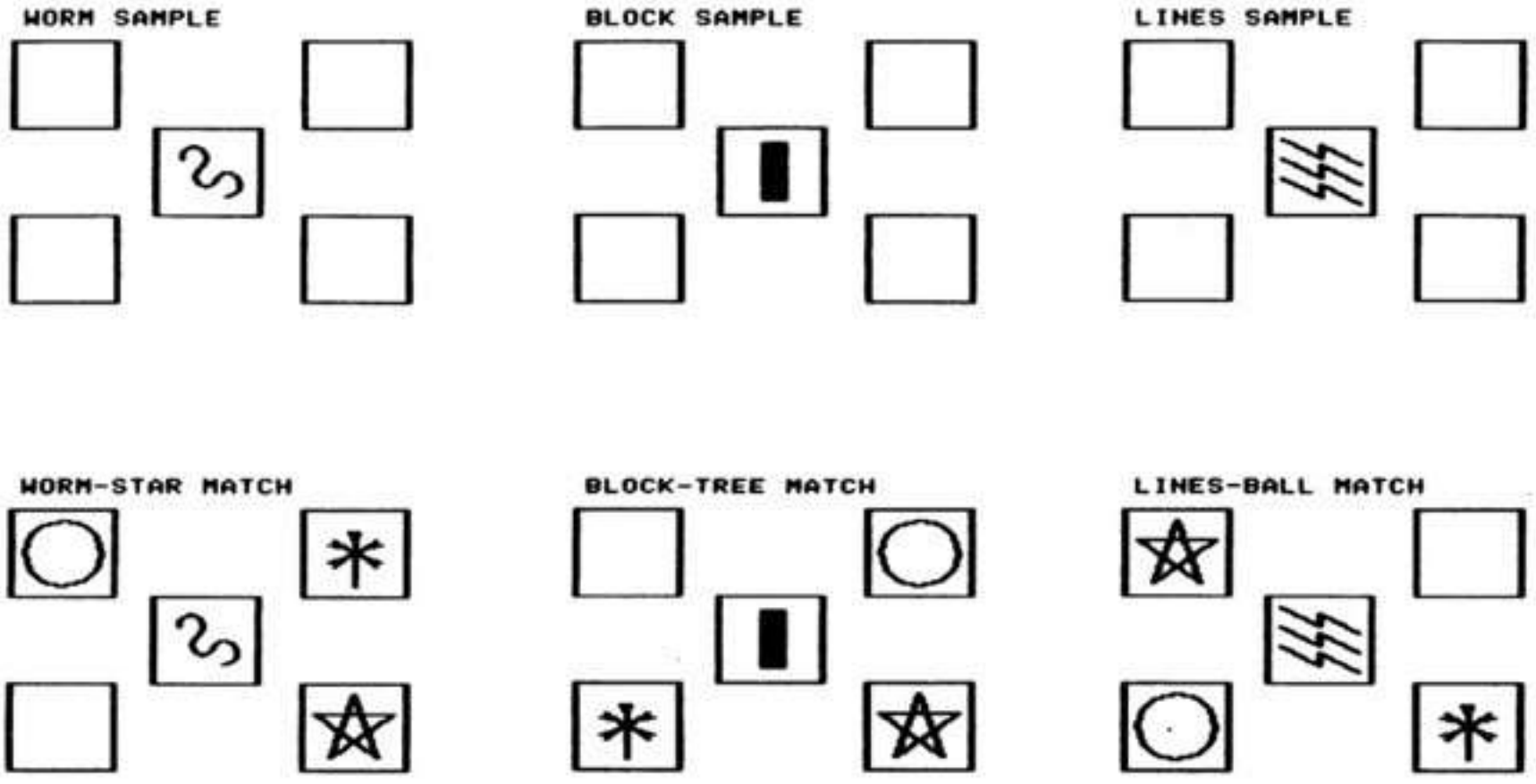
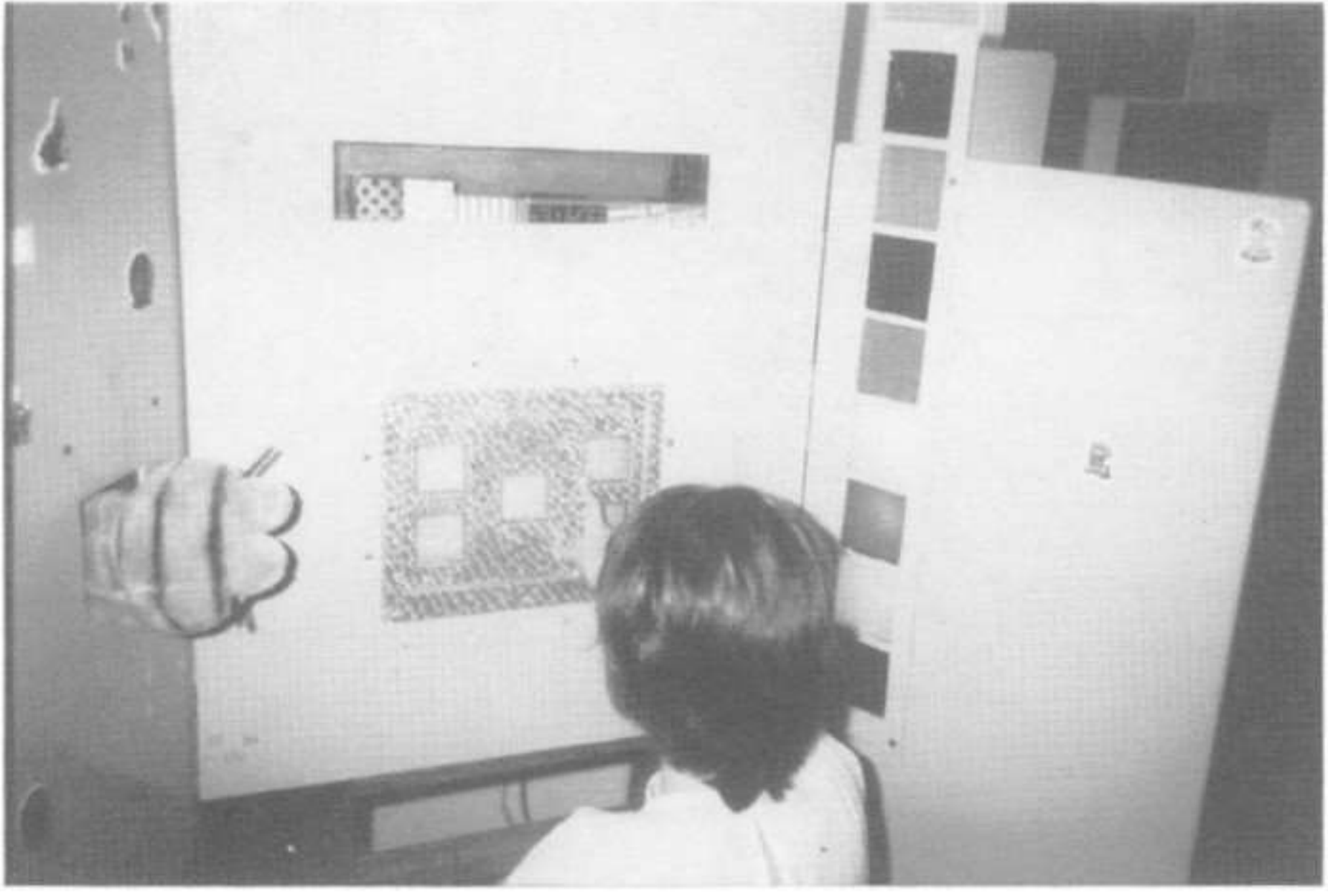


Fig. 5. Three examples of arbitrary matching stimuli. The sample first appeared in the center window (top row). A press on that window turned on the three comparison stimuli in varying positions from trial to trial with the remaining window blank (bottom row).



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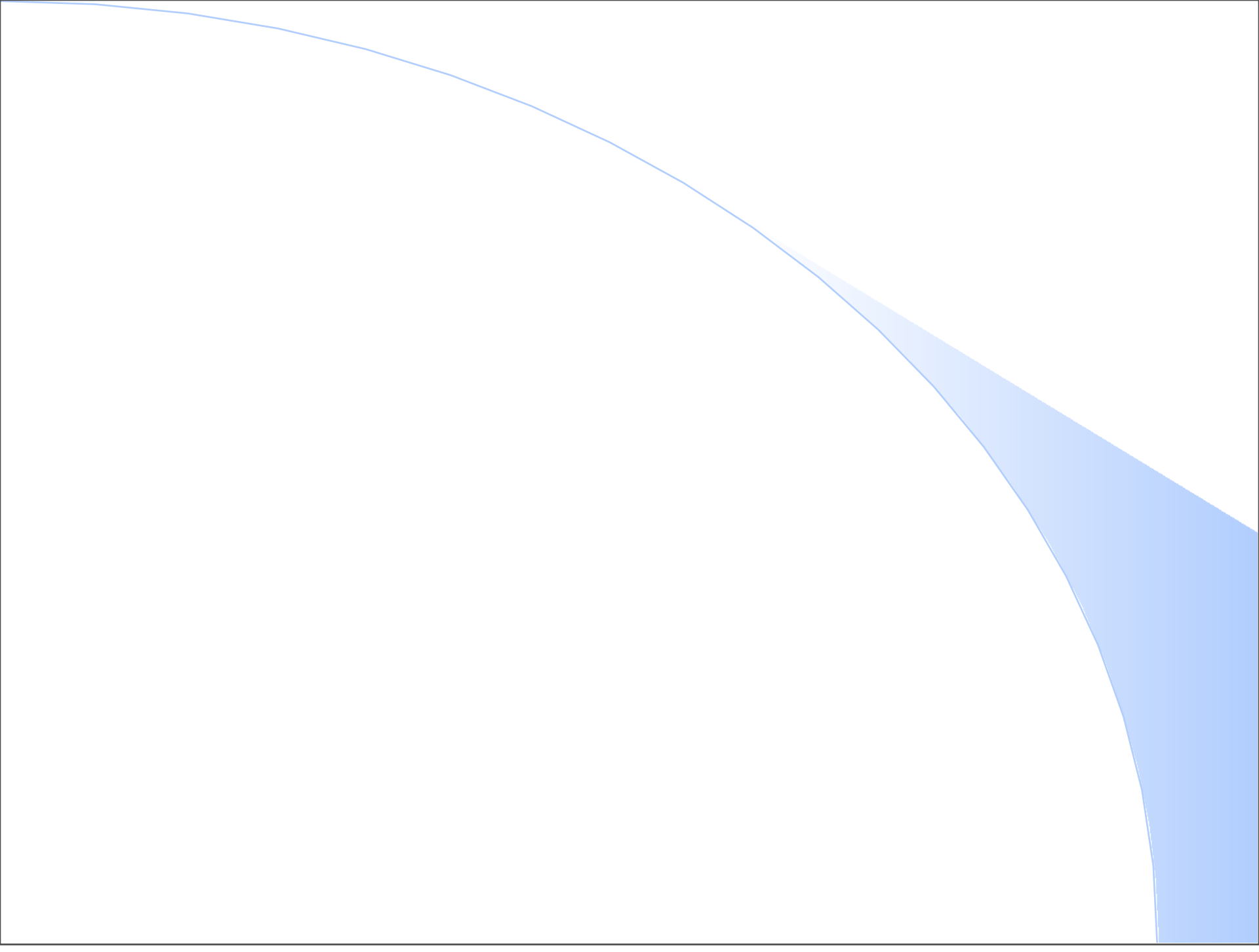
describe functional transfer data – relate to traffic lights



Tuesday, August 2, 2016

Verbally Governed Behavior

- Behavior, either verbal or nonverbal, under the control of verbal antecedents. It has also been called rule-governed behavior or instruction-following. Verbally governed behavior is an example of a higher-order class. In a higher-order class, the local contingencies that maintain particular instances may differ from the contingencies (often social) that maintain the higher-order class

Verbally Governed Behavior: Quotation from "Operant Analysis of Problem Solving"

- **(pp. 150-151)** ***Rule-governed behavior is in any case never exactly like the behavior shaped by contingencies.... [Even] when topographies of response are very similar, different controlling variables are necessarily involved, and the behavior will have different properties. When operant experiments with human subjects are simplified by instructing the subjects in the operation of the equipment..., the resulting behavior may resemble that which follows exposure to the contingencies..., but the controlling variables are different, and the behaviors will not necessarily change in the same way in response to other variables***

THE BEHAVIORAL AND BRAIN SCIENCES (1984) 7, 583-613
Printed in the United States of America

An operant analysis of problem solving

B. F. Skinner
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Abstract: Behavior that solves a problem is distinguished by the fact that it changes another part of the solver's behavior and is strengthened when it does so. Problem solving typically involves the construction of discriminative stimuli. Verbal responses produce especially useful stimuli, because they affect other people. As a culture formulates maxims, laws, grammar, and science, its members behave more effectively without direct or prolonged contact with the contingencies thus formulated. The culture solves problems for its members, and does so by transmitting the verbal discriminative stimuli called rules. Induction, deduction, and the construction of models are ways of producing rules. Behavior that solves a problem may result from direct shaping by contingencies or from rules constructed either by the problem solver or by others. Because different controlling variables are involved, contingency-shaped behavior is never exactly like rule-governed behavior. The distinction must take account of (1) a system which establishes certain contingencies of reinforcement, such as some part of the natural environment, a piece of equipment, or a verbal community; (2) the behavior shaped and maintained by these contingencies; (3) rules, derived from the contingencies, which specify discriminative stimuli, responses, and consequences, and (4) the behavior occasioned by the rules.

Keywords: contingency-shaped behavior; deduction; discriminative stimuli; hypotheses; induction; model building; operant analysis; problem solving; reinforcement contingencies; rule-governed behavior; verbal behavior

Behavior which solves a problem is distinguished by the fact that it changes another part of the solver's behavior and is reinforced when it does so. Two stages are easily identified in a typical problem. When hungry we face a problem if we cannot emit any of the responses previously reinforced with food; to solve it we must change the situation until a response occurs. The behavior which brings about the change is properly called problem solving and the response it promotes a solution. A question for which there is at the moment no answer is also a problem. It may be solved by performing a calculation, by consulting a reference work, or by acting in any way which helps in recalling a previously learned answer. Since there is probably no behavioral process which is not relevant to the solving of some problem, an exhaustive analysis of techniques would coincide with an analysis of

chain of responses: orienting toward and approaching the latch, touching and turning the latch, orienting toward and passing through the opened door, and approaching and eating the food. Some links in this chain may have been reinforced by the food and others by escape from the box, but some could be reinforced only after other reinforcers had been conditioned. For these and other reasons the box presented a problem—for both the cat and Thorndike.

Thorndike thought he solved *his* problem by saying that the successful cat used trial-and-error learning. The expression is unfortunate. "Try" implies that a response has already been affected by relevant consequences. A cat is "trying to escape" if it engages in behavior which either has been selected in the evolution of the species because it has brought escape from comparable situations or has

Classes of Verbal Behavior

- THE FORMAL VERBAL CLASSES
  - Echoic Behavior
  - Dictation-Taking
  - Textual Behavior
  - Transcription
- THE TACT AND NAMING
  - Naming
  - Extensions of the Tact
  - Metaphor
  - Private Events
- THE MAND AND MANDING

- INTRAVERBAL BEHAVIOR
- AUDIENCES
  The Listener
- COMBINATIONS OF VERBAL PROCESSES
  - Multiple Causation
  - Adduction
  - Autoclitic Processes
  - Higher-Order Classes
  - Verbally Governed Behavior

These are not theories.

They are properties of verbal behavior.

Some VB quotations on thinking

- **(p. 438)** ***There is no point at which it is profitable to draw a line distinguishing thinking from acting on this continuum. So far as we know, the events at the covert end have no special properties, observe no special laws, and can be credited with no special achievements***
- **(p. 449)** ***The simplest and most satisfactory view is that thought is simply*** **behavior*---verbal or nonverbal, covert or overt. It is not some mysterious process responsible for behavior but the very behavior itself in all the complexity of its controlling relations***

Verbal behavior is “effective only through the mediation of other persons” (Skinner, 1957, p. 2)

- The irreducible function of verbal behavior is that it is an efficient way in which one individual can get another individual to do something
- Sometimes the effects are nonverbal, as when we ask someone to do something; sometimes the effects are verbal, as when we change what someone has to say about something
- All other functions of verbal behavior (e.g., communication, truth, logic) are derivatives of this primary function and gain their significance only through it

Segue into evolution of VB

The Origin and Evolution of Verbal Behavior

- **Verbal behavior can emerge only in organisms whose behavior is sensitive to social contingencies**
- **Consider the advantages of a single vocal releaser functionally equivalent to “Stop!”**
- **A minimal repertory of fixed action patterns elicited by vocal releasers may evolve into a richly differentiated repertory**
- **Once in place, ontogenic contingencies may begin to supplement this rudimentary vocal control**

The Origin and Evolution of Verbal Behavior

Verbal behavior requires 3 varieties of selection:

- ***Phylogenic selection*, as populations of organisms (and their genes) are selected by evolutionary contingencies**
- ***Ontogenic selection*, as populations of responses are selected within lifetimes**
- ***Cultural or memetic selection*, as populations of responses are passed on within groups and across generations**

The Origin and Evolution of Verbal Behavior

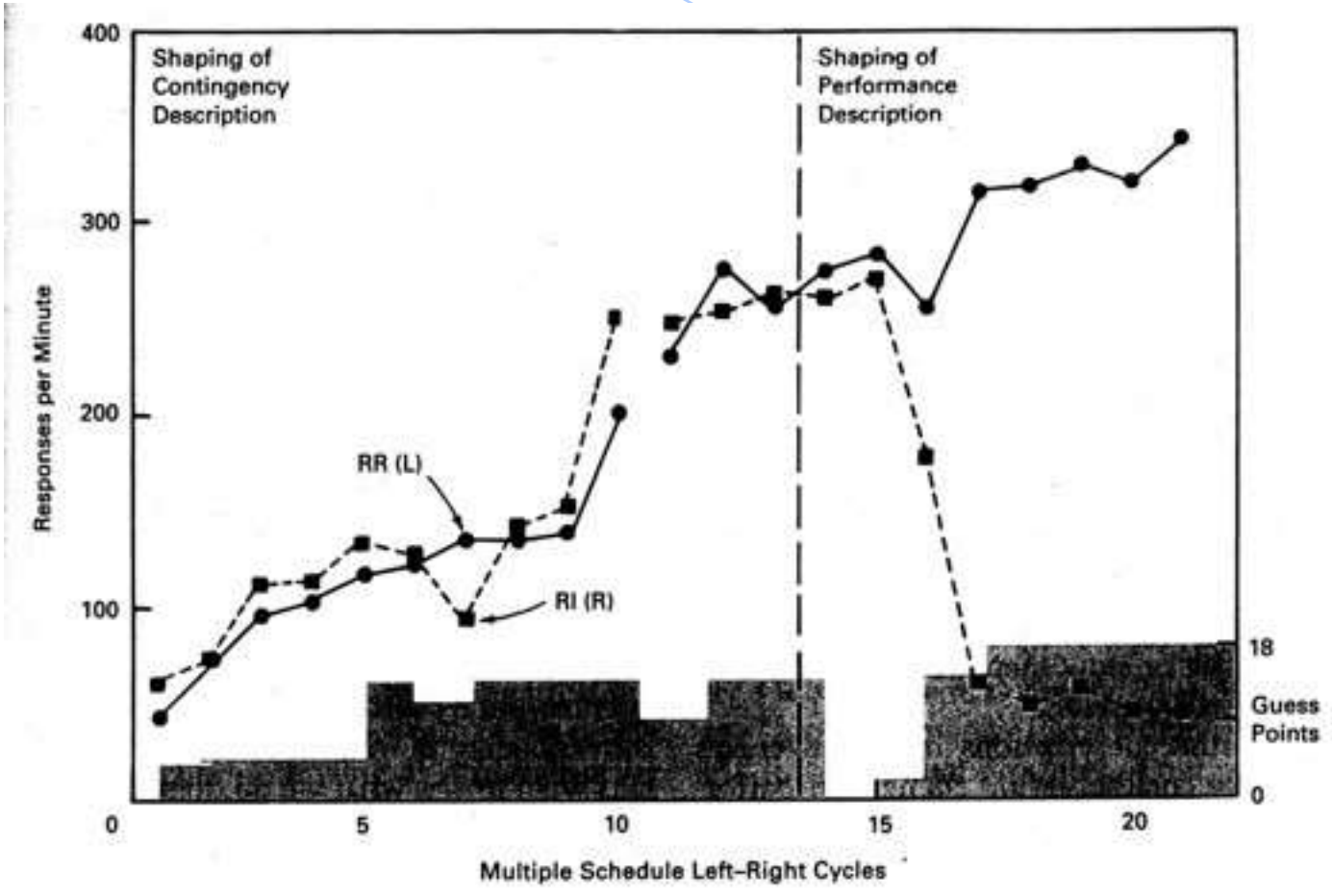
- **Why should contingencies favor repetition?**
  - **The effects of repetitions may summate**
  - **Once verbal governance is in place, the listener's replication of the speaker's verbal behavior extends the influence of the speaker**
  - **The listener's replication of the listener's own verbal behavior creates conditions under which verbal governance may become extended over time, in the speaker's absence**
  - **Verbal governance can then be maintained by powerful social contingencies**

Five Functional Properties of Verbal Behavior

- **Verbal Governance of Both Verbal and Nonverbal Behavior**

Verbal Governance: Verbal antecedents that specify behavior may produce that behavior

- **Verbal governance is maintained by potent social contingencies involving either reinforcing or aversive consequences (the military provides an obvious example)**


Shaping of
Contingency
Description
Shaping of
Performance
Description
400
300
200
100
0
Responses per Minute
RR (L)
RI (R)
18
Guess
Points
0
5
10
15
20
Multiple Schedule Left–Right Cycles

Verbal Governance: Verbal antecedents that specify behavior may produce that behavior

- **Verbal governance is maintained by potent social contingencies involving either reinforcing or aversive consequences (the military provides an obvious example)**
- **Verbal governance is a higher-order class. Local contingencies that operate on specific instances need not be consistent with the contingencies that maintain the higher-order class. Either may dominate, i.e., behavior may be more sensitive to changes in one than to changes in the other**
- **Verbal governance may operate on verbal as well as nonverbal behavior**

Verbal Governance of Verbal Behavior

- **One class of human behavior more likely to be locally than verbally governed is verbal behavior itself. Everyday language does not include effective vocabularies for functional properties of our own verbal behavior, so we rarely talk about the variables that determine it. In other words, verbal behavior is not usually verbally governed**

VERBAL GOVERNANCE VERBAL

S^D's --> VERBAL / NONVERBAL R's VERBAL / NONVERBAL R's --> CONSEQ's

Five Functional Properties of Verbal Behavior

- Verbal Governance of Both Verbal and Nonverbal Behavior
- Echoic and Other Replicative Processes

Replication: We tend to repeat what we and others say

- Replication of verbal behavior allows spatial and temporal extensions of verbal governance
- Once some individuals begin repeating what others say, verbal behavior is maintained by cultural as well as ontogenic contingencies and survives across generations
- Listener repetitions create conditions under which instructions may be followed in the speaker's absence, later and elsewhere, in effect, transferring governance from a speaker's verbal behavior to the listener's replication
- Effects of repetitions may summate

VERBAL GOVERNANCE

VERBAL S^D's --> VERBAL / NONVERBAL R's

VERBAL / NONVERBAL R's --> CONSEQ's

REPLICATION

VERBAL S^D's --> VERBAL R's

VERBAL R's --> VERBAL S^D's

Five Functional Properties of Verbal Behavior

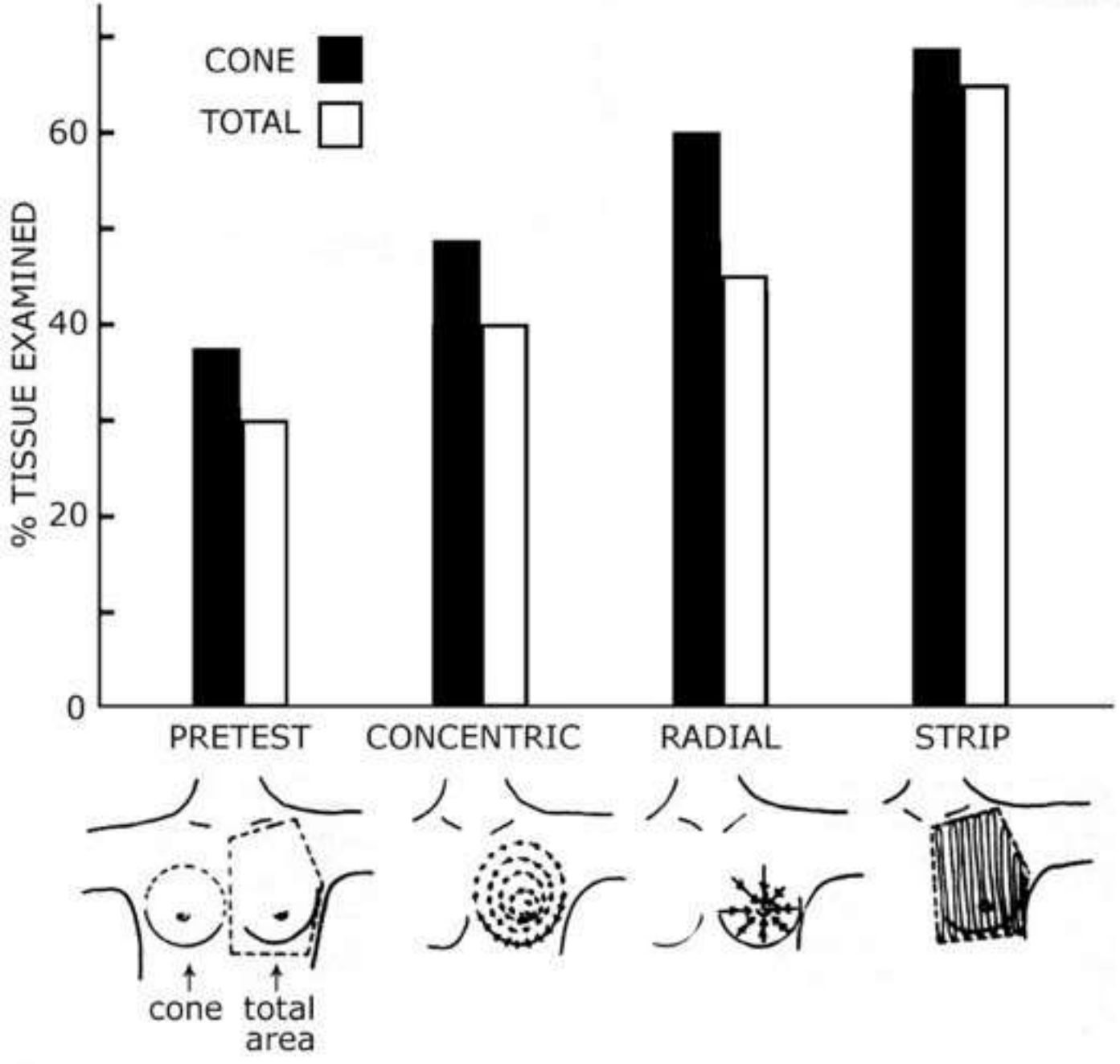
- Verbal Governance of Both Verbal and Nonverbal Behavior
- Echoic and Other Replicative Processes
- Differential Attention to Positive and to Aversive Verbal Stimuli

Attention to Verbal Stimuli: We attend to verbal stimuli based on their correlation with reinforcing or aversive consequences

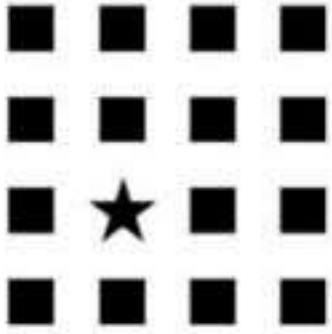
- **A message's effectiveness depends more on whether its content is reinforcing or aversive than on whether it is correct or complete or consistent**
- **What needs explanation is that humans attend at all to bad news. It may be relevant that bad news sometimes allows effective avoidance behavior and that stimuli correlated with sufficient reinforcers may maintain attention even when also correlated with aversive events**

TABLE 8–2 Signal-detection contingencies: Possible responses to the presence or absence of a signal.

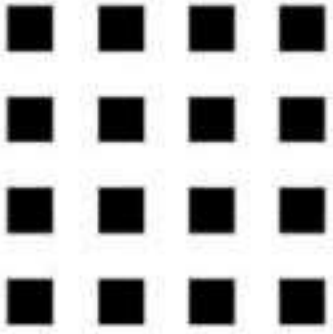
"Was there a signal?"	Signal in context	Context only
"Yes"	Hit (True Positive)	False Alarm (False Positive)
"No"	Miss (False Negative)	Correct Rejection (True Negative)


CONE
TOTAL
% TISSUE EXAMINED
60
40
20
0
PRETEST
CONCENTRIC
RADIAL
STRIP
cone
total area

Feature Positive



Peck → Food



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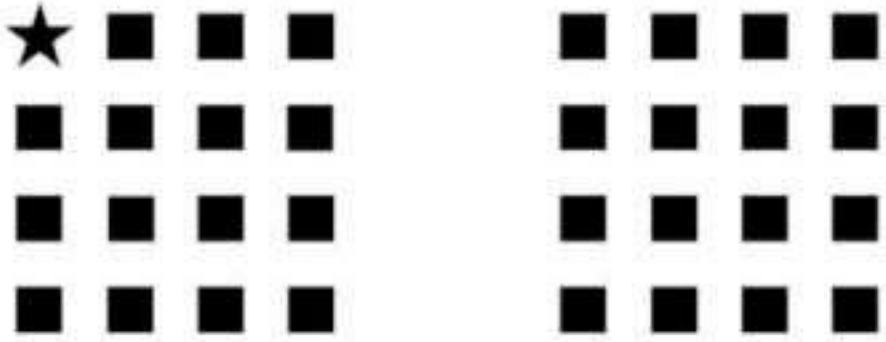
Feature Positive

Feature Positive



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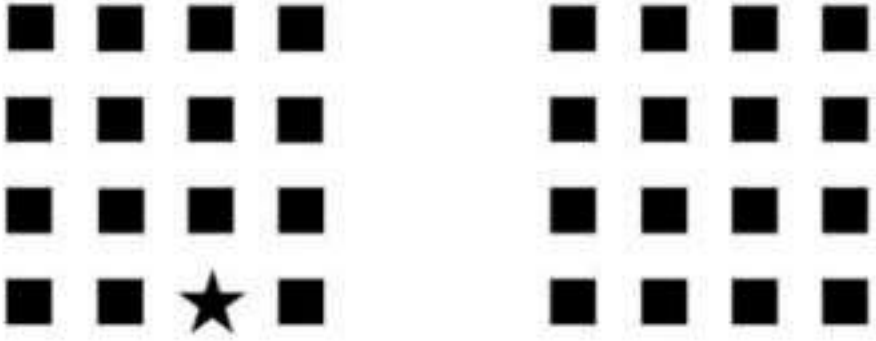

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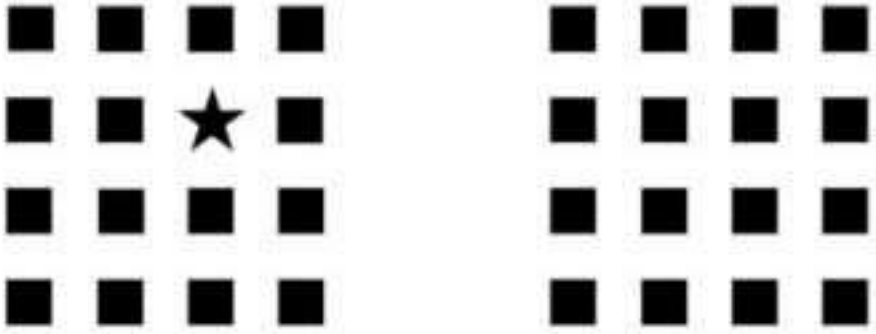

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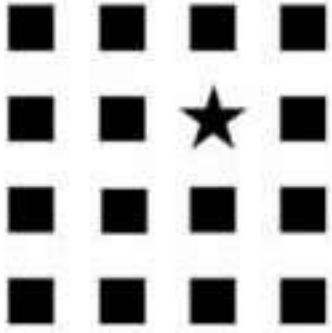
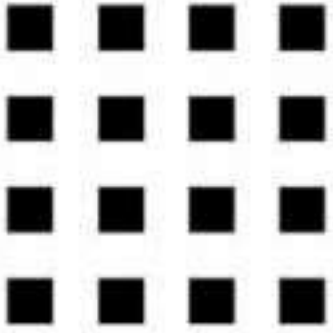
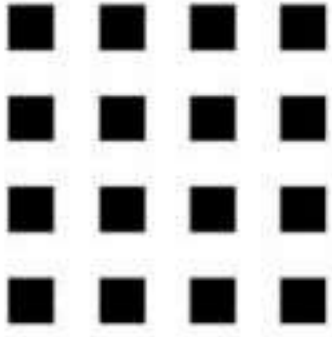


Peck → Food

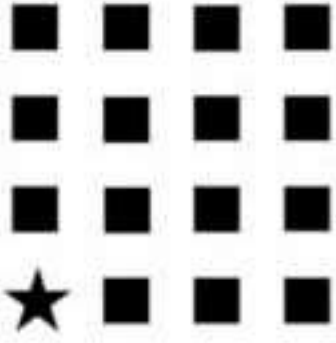


Peck → No Food

Feature Negative



Peck → Food



Peck → No Food

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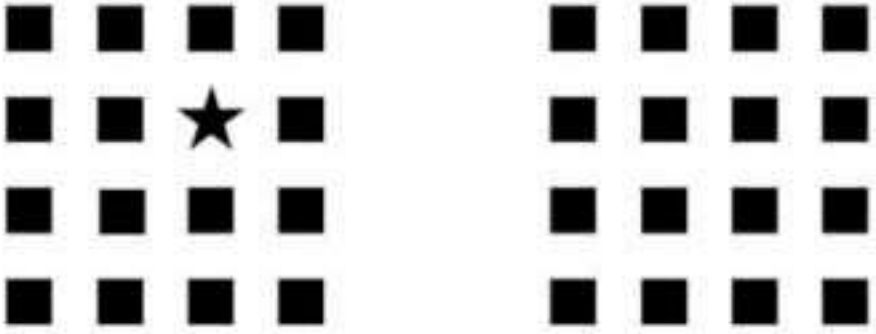

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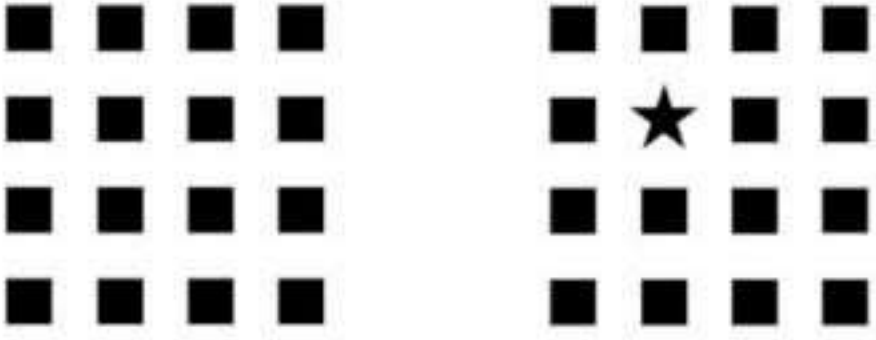

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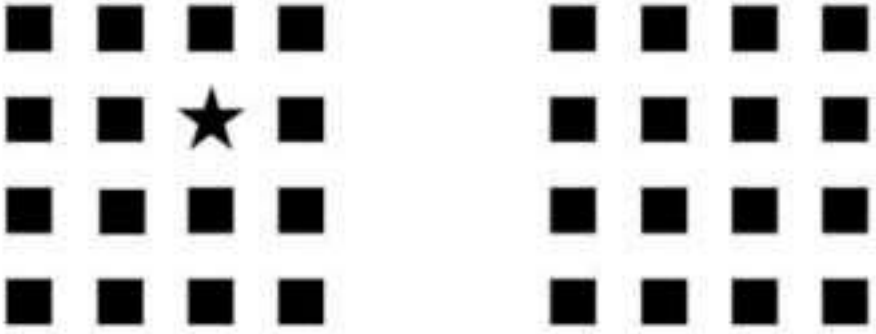

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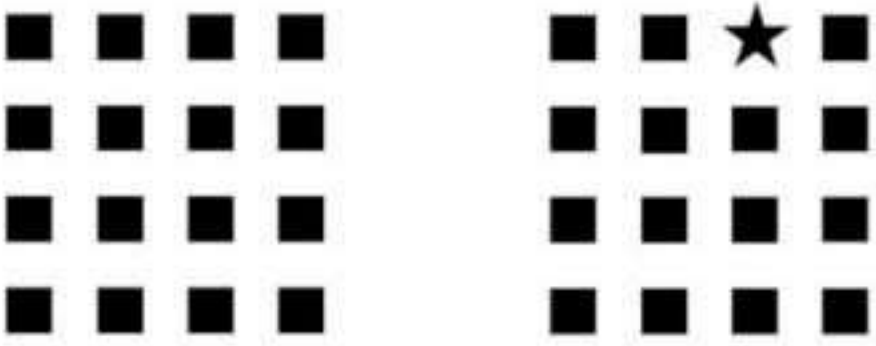

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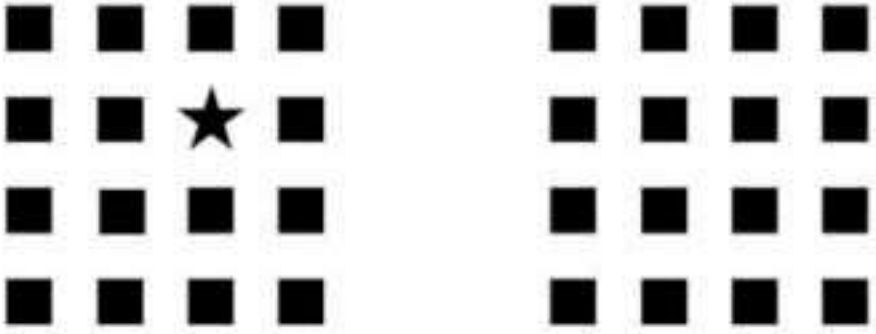

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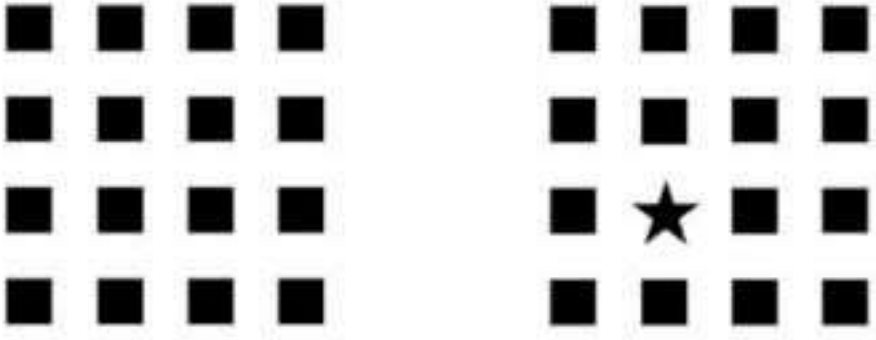

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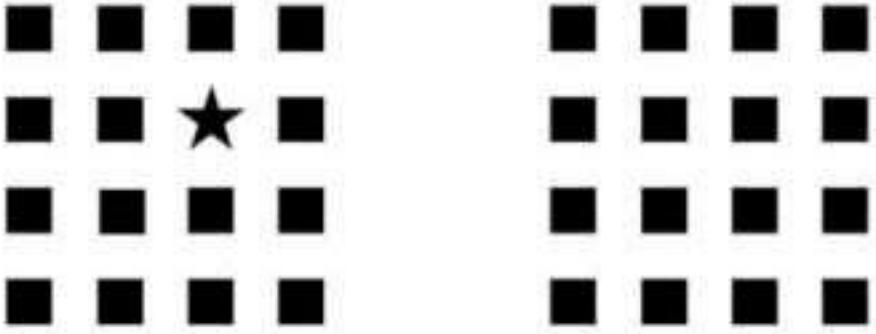

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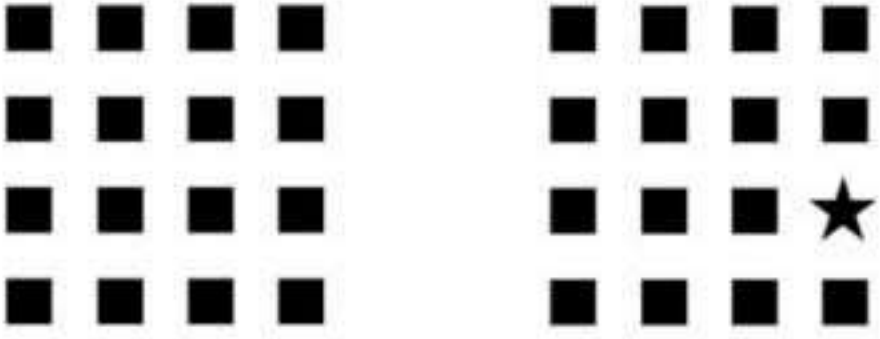

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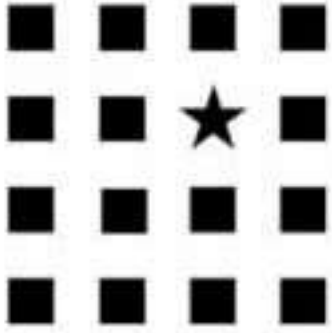
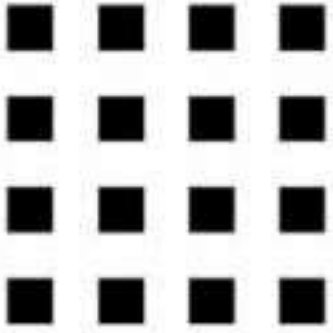


Peck → Food



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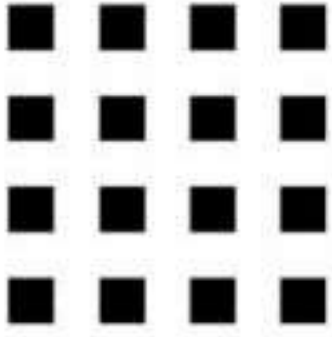

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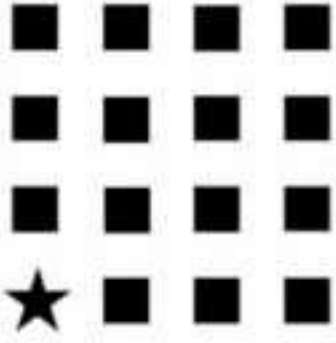

Peck → No Food

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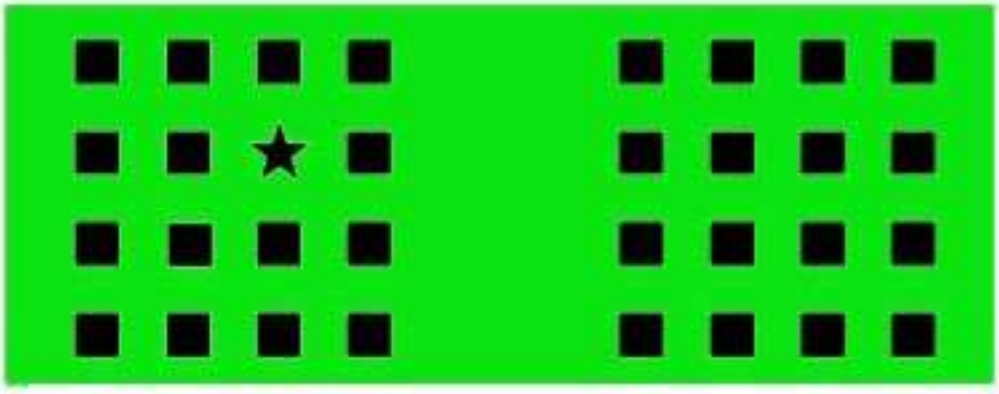

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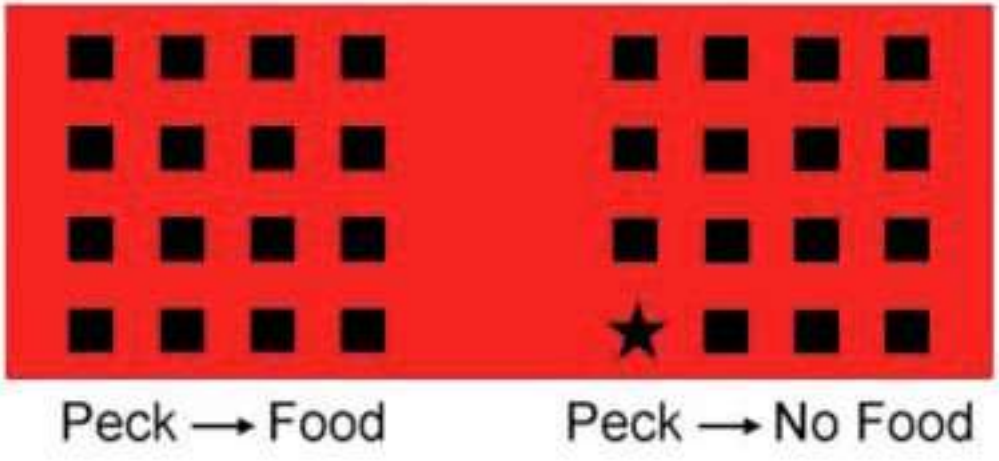


RFT or EXT

RFT

EXT

Observing Responses Have No Effect (Mixed Schedule)

RFT or EXT

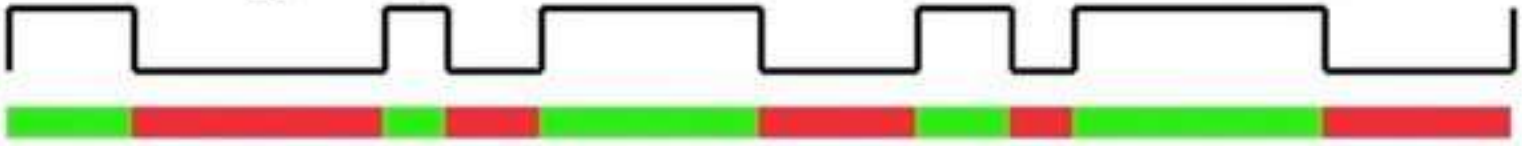
RFT

EXT

(Examples show stimuli that would appear if observing responses are emitted; stimulus remains yellow if no observing responses occur.)

Observing Responses Have No Effect (Mixed Schedule)

Observing Responses Produce Both RFT & EXT Stimuli



RFT or EXT

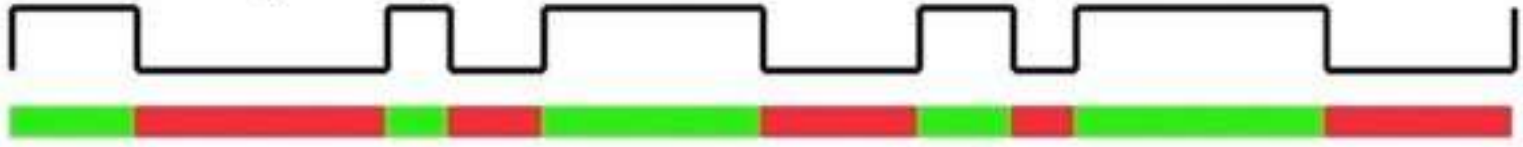
RFT

EXT

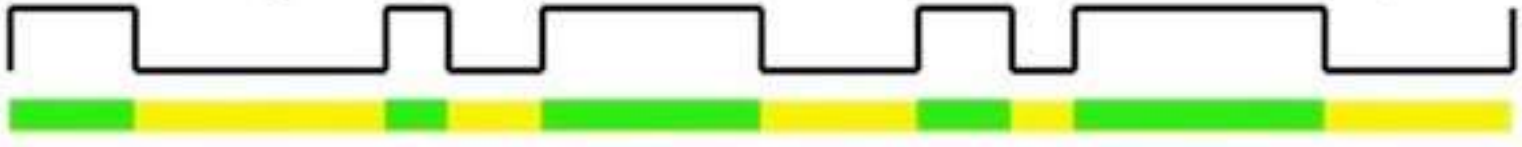
(Examples show stimuli that would appear if observing responses are emitted; stimulus remains yellow if no observing responses occur.)

Observing Responses Have No Effect (Mixed Schedule)

Observing Responses Produce Both RFT & EXT Stimuli



Observing Responses Produce RFT Stimulus Only



RFT or EXT

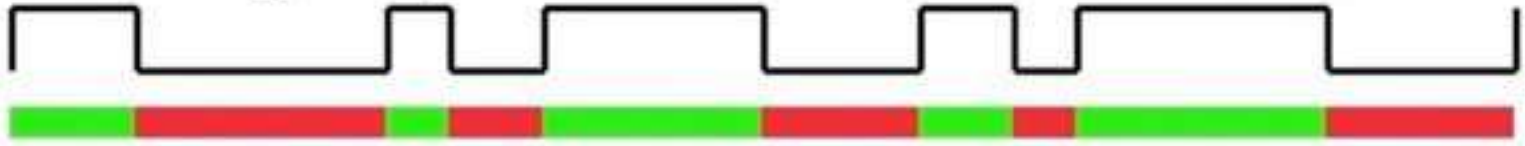
RFT

EXT

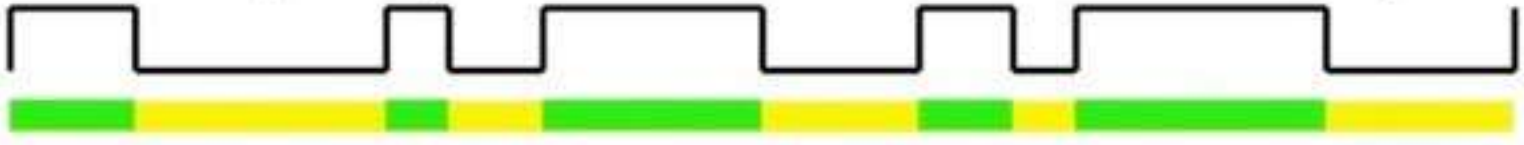
(Examples show stimuli that would appear if observing responses are emitted; stimulus remains yellow if no observing responses occur.)

Observing Responses Have No Effect (Mixed Schedule)

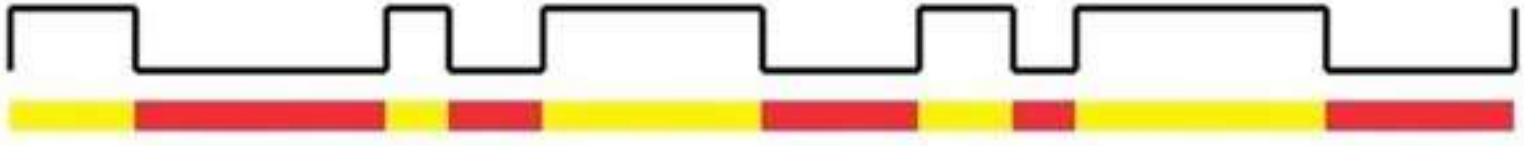
Observing Responses Produce Both RFT & EXT Stimuli



Observing Responses Produce RFT Stimulus Only



Observing Responses Produce EXT Stimulus Only



VERBAL GOVERNANCE

VERBAL S^D's --> VERBAL / NONVERBAL R's

VERBAL / NONVERBAL R's --> CONSEQ's

REPLICATION

VERBAL S^D's --> VERBAL R's

VERBAL R's --> VERBAL S^D's

DIFFERENTIAL ATTENTION

VERBAL / NONVERBAL R's --> VERBAL S^D's

VERBAL S^D's --> VERBAL / NONVERBAL R's

Five Functional Properties of Verbal Behavior

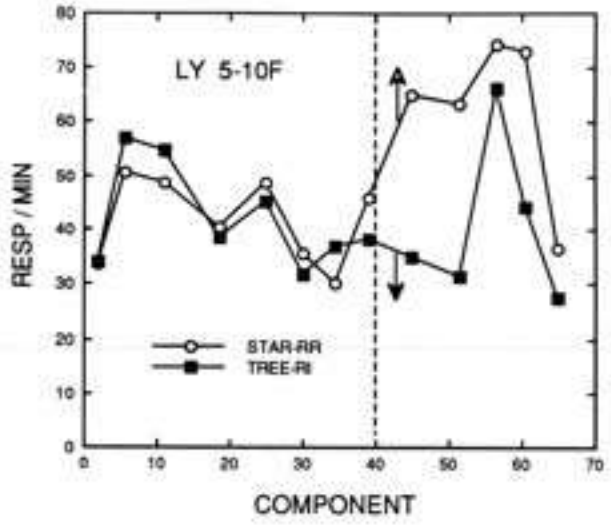
- Verbal Governance of Both Verbal and Nonverbal Behavior
- Echoic and Other Replicative Processes
- Differential Attention to Positive and to Aversive Verbal Stimuli
- The Shaping of Verbal Behavior

Verbal Shaping: Verbal behavior may be shaped by both social and nonsocial consequences

- Verbal shaping can operate along semantic or other verbal dimensions as well as along physical dimensions such as topography
- Audiences set occasions on which verbal behavior has consequences and provide reinforcers that shape verbal behavior. Different audiences set the occasion for different verbal classes

Verbal Shaping: Some examples from Greenspoon through Keller and beyond

- **Verbal shaping of plurals**
- **Verbal shaping in an introductory psychology lab**
- **Verbal shaping on a psychiatric ward**


LY 5-10F
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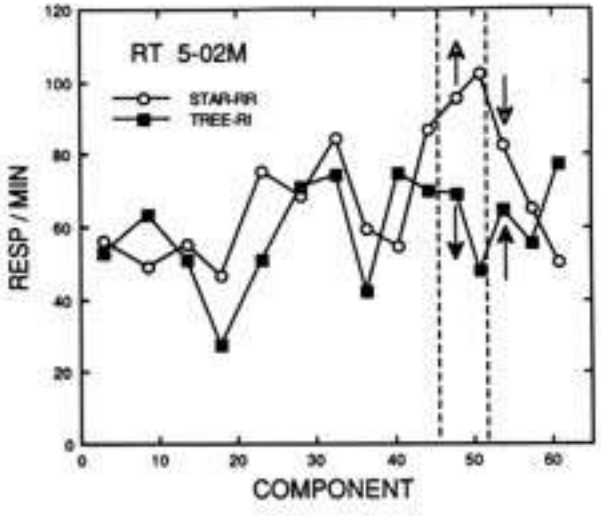
TREE-RI
COMPONENT


RT 5-02M
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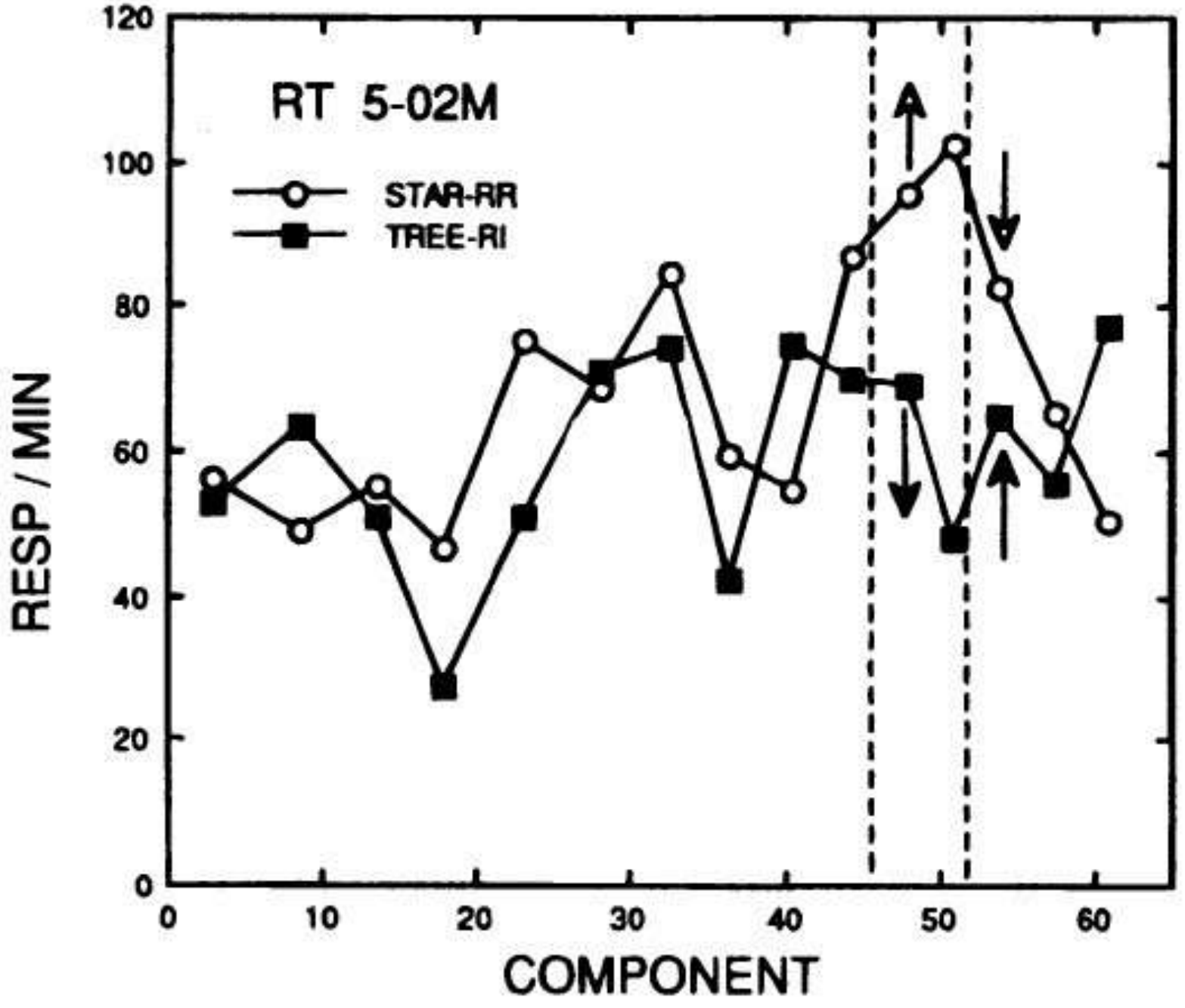
TREE-RI
RESP / MIN
COMPONENT


RT 5-02M
STAR-RR
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RESP / MIN
COMPONENT
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20
40
60
80
100
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0
10
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30
40
50
60

VERBAL GOVERNANCE

VERBAL S^D's --> VERBAL / NONVERBAL R's

VERBAL / NONVERBAL R's --> CONSEQ's

REPLICATION

VERBAL S^D's --> VERBAL R's

VERBAL R's --> VERBAL S^D's

DIFFERENTIAL ATTENTION

VERBAL / NONVERBAL R's --> VERBAL S^D's

VERBAL S^D's --> VERBAL / NONVERBAL R's

VERBAL SHAPING

VERBAL R's --> CONSEQUENCES

NEW VERBAL R'S --> VERBAL S^D's

Five Functional Properties of Verbal Behavior

- Verbal Governance of Both Verbal and Nonverbal Behavior
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- Recruitment of Emotional Responses through Equivalences and Semantic Conditioning

Discrimination and Prejudice

- Example: Among Catholics and Protestants of Northern Ireland, names and flags and favored sports differ across the groups. They easily mastered equivalences involving neutral stimuli but had trouble when Protestant and Catholic stimuli were linked: e.g., if A in an AB match was Irish green and C in a BC match was an image of marching Orangemen, so each class included both Protestant and Catholic properties, acquisition was slow and learners typically failed tests of equivalence; by age 11, these effects were often locked in.
- But it is hopeful that such outcomes were less likely among learners who attended universities with substantial mixes of Catholic and Protestant students(McGlinchey & Keenan, *Behavior and Social Issues*, 1997).
- We must learn more not only about how equivalences are created, but how they can be broken down.

VERBAL GOVERNANCE

VERBAL S^D's --> VERBAL / NONVERBAL R's

VERBAL / NONVERBAL R's --> CONSEQ's

REPLICATION

VERBAL S^D's --> VERBAL R's

VERBAL R's --> VERBAL S^D's

DIFFERENTIAL ATTENTION

VERBAL / NONVERBAL R's --> VERBAL S^D's

VERBAL S^D's --> VERBAL / NONVERBAL R's

VERBAL SHAPING

VERBAL R's --> CONSEQUENCES

NEW VERBAL R'S --> VERBAL S^D's

RECRUITMENT OF EMOTIONAL RESPONSES

EQUIVALENCE CLASSES: VERBAL S^D's AND VERBAL R's

VERBAL GOVERNANCE

VERBAL S^D's --> VERBAL R's

VERBAL R's --> CONSEQ's

REPLICATION

VERBAL S^D's --> VERBAL R's

VERBAL R's --> VERBAL S^D's

DIFFERENTIAL ATTENTION

VERBAL R's --> VERBAL S^D's

VERBAL S^D's --> VERBAL R's

VERBAL SHAPING

VERBAL R's --> CONSEQUENCES

NEW VERBAL R'S --> VERBAL S^D's

RECRUITMENT OF EMOTIONAL RESPONSES

EQUIVALENCE CLASSES: VERBAL S^D's AND VERBAL R's

Tuesday, August 2, 2016

These exclude the nonverbal cases, and illustrate how verbal behavior can become isolated from the nonverbal environment

Five Functional Properties of Verbal Behavior

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- Echoic and Other Replicative Processes
- Differential Attention to Positive and to Aversive Verbal Stimuli
- The Shaping of Verbal Behavior
- Recruitment of Emotional Responses through Equivalences and Semantic Conditioning

These are not theories.

They are properties of verbal behavior.

The Five Pillars of Art and Literature and Culture

- They survive through replication
- They are shaped by audiences
- They may change behavior, as when stories have morals
- They command attention because they provide opportunities for reinforcing behavior, as in looking, listening, reading
- Their success typically depends on how well they recruit emotional behavior


Hamlet
Beowulf
Candide
Moby Dick
Spiderman
Harry Potter
Don Quixote
Animal Farm
The Odyssey
Invisible Man
Frankenstein
Oedipus Rex
Madame Bovary
Sherlock Holmes
Gulliver’s Travels
Huckleberry Finn
Waiting for Godot The
Arabian Nights Pride
and Prejudice Alice in
Wonderland The
Handmaid’s Tale The
Canterbury Tales The
Lord of the Rings
The Brothers Karamazov

The Five Pillars of Scientific Verbal Behavior

- It must be replicable
- It is shaped by the scientific community
- Its methodologies provide instructions that govern research
- New discoveries about how the world works are the ones that attract attention
- It recruits behavior not only through the effectiveness of its applications but also through the beauty of successful analyses

The Calculus
Godel's Proof
Chaos Theory
Boolean Logic
Verbal Behavior
Newton's Optics
Quantum Theory
The Double Helix
The Selfish Gene
Euclid's Elements
Animal Intelligence
Mendelian Genetics
The Descent of Man
Galileo's Discourses
The Origin of Species
Conditioned Reflexes
Archimedes' Theorem
The Theory of Relativity
Newton's Laws of Motion
The Behavior of Organisms
The Indeterminacy Principle
On the Circulation of the Blood
The Periodic Table of the Elements
The Integrative Action of the Nervous System

The Five Pillars of Love Speech and Hate Speech

- Be sure to repeat it over and over
- Be sure to shape it wherever you find it
- Be sure the speech includes reinforcing content
- Be sure to build upon existing emotional verbal classes
- Be sure it includes directions about how to behave (but get the listeners to say them)

No accident that these are imperatives, not statements

Avesta
I Ching
Dianetics
The Koran
The Talmud
Nihon Shoki
Mein Kampf
Tao Te Ching
The Adi Granth
Bhagavad-Gita
The Upanishads
The Old Testament
The Brahma-Sutras
The New Testament
The Code of Bushido
The Book of Mormon
The Napoleonic Code
The Code of Hammurabi
Bodhisattvacharyavatara
The Analects of Confucius
The Communist Manifesto
The Egyptian Book of the Dead
The Declaration of Independence
The Little Red Book of Chairman Mao

The Maintenance of Verbal Behavior by Social Contingencies

- The social reinforcers maintaining these functions are usually small, but they operate over weeks and months and years
- We know how much behavior we can shape in just minutes with a nonverbal organism
- Should we be surprised at the effects of interlocking verbal contingencies operating over human lifetimes?

The Relation of Verbal Behavior to Nonverbal Environments

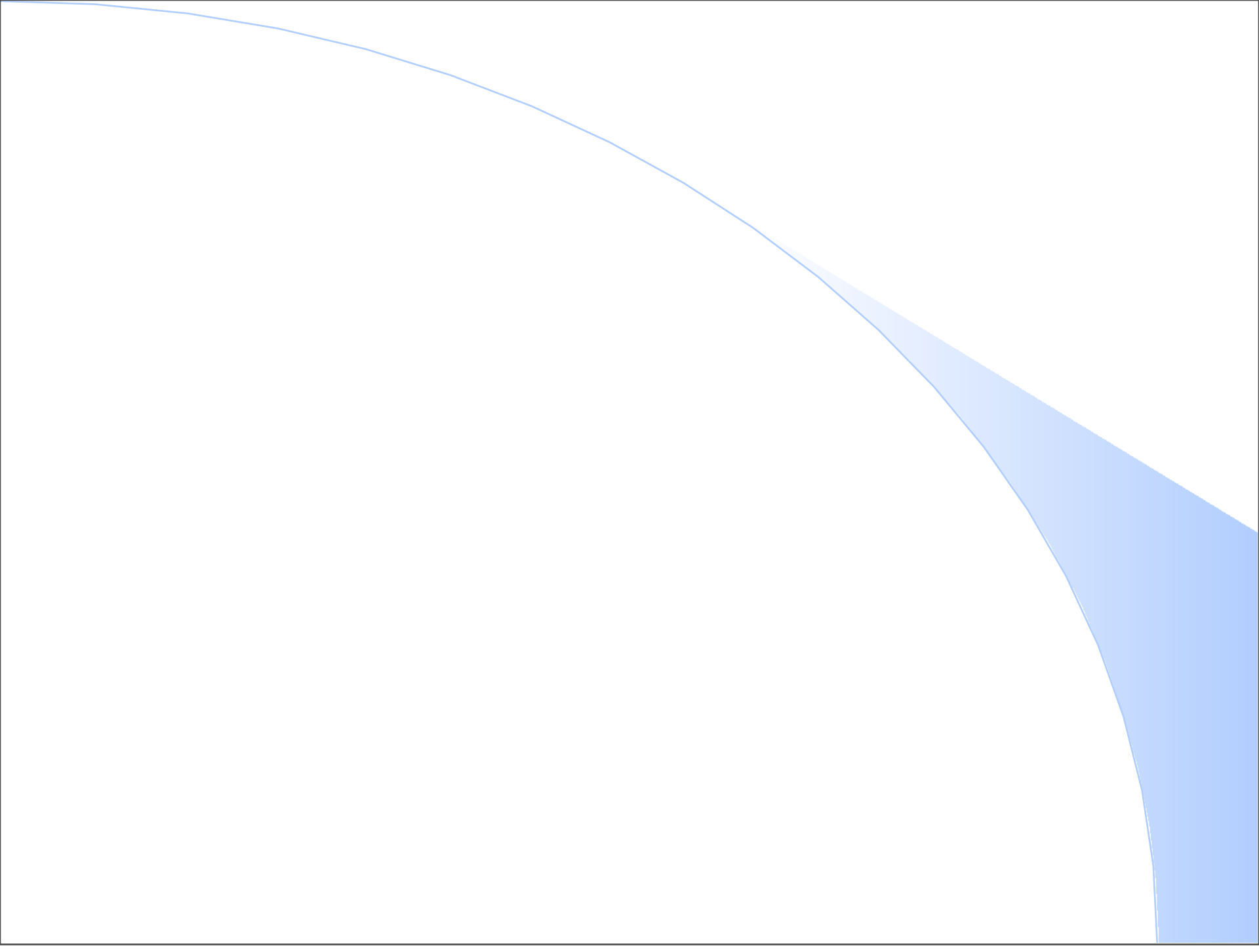
- Verbal behavior can be tightly determined by environmental events, as in scientific practices
- But it can also be loosely determined, as in social practices (for example, literature and religion)
- The continuum from real events to acted events to scripts for performance to fiction and other texts illustrates these dimensions of verbal behavior

Enduring Verbal Contingencies

- Human behavior is heavily influenced by records of verbal behavior long past
- Religious behavior provides compelling examples of the phenomena we reviewed:
  - Replication of verbal behavior in sacred texts
  - Verbal governance in following religious precepts
  - Shaping of verbal behavior in reciting scripture or in other rituals
  - Differential attention to prescribed and proscribed texts
  - Emotional ties to significant events: birth, love, death

The Novel Effects of Verbal Behavior

- **Angels and devils, like unicorns and centaurs, can exist only as verbal creations**
- **Heaven and hell, like Bilbo Baggins and Harry Potter, can exist only as verbal creations**
- **Utterances that threaten the interlocking verbal contingencies that we have examined are sometimes called blasphemy**



Tuesday, August 2, 2016

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Verbal Behavior

- THE FORMAL VERBAL CLASSES
- Echoic Behavior
- Dictation-Taking
- Textual Behavior
- Transcription

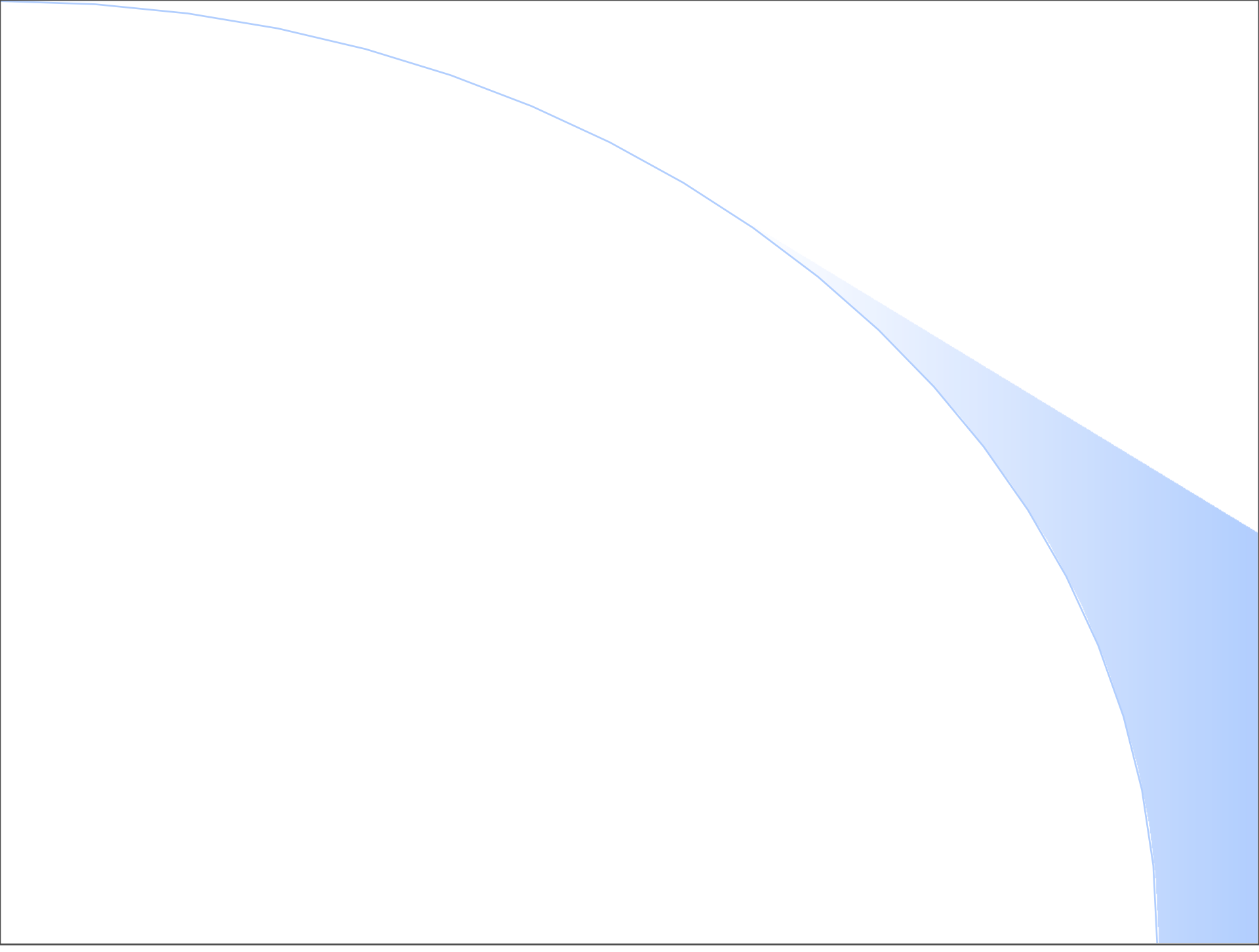
- THE TACT AND TACTING
- Naming
- Extensions of the Tact
- Metaphor
- Private Events

- INTRAVERBAL BEHAVIOR

- THE MAND AND MANDING

- AUDIENCES
- Listener Behavior

- COMBINATIONS OF VERBAL PROCESSES
- Multiple Causation
- Autoclitic Processes
- Higher-Order Classes and Adduction
- Verbally Governed Behavior



Tuesday, August 2, 2016