An Introduction to Relational Frame Theory: Practical Applications for EIBI Programs

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Overview

Generative Verbal Behavior
- What is it?
- How do we approach it?

Relational Frame Theory
- Background
- Relational Responding
- Relational Frames
- Transformation of Function
- Origins of AARR

Teaching Relational Framing
- Precursors
- Establishing Initial Frames
- Establishing Other Frames

"How can we understand a sentence we've never heard before; and how can we say a meaningful sentence we've never heard or said before?"
- Richard Malott

GVB in Human Language

Which of the above is a jumjaw?
Where does a jumjaw live?
What does a jumjaw say?
Tell me something smaller than a jumjaw.
If there was a jumjaw at the back of the room, how would you react?

A jumjaw is the same as a dog

How do we explain GVB?
- Pavlovian Conditioning?
- Direct Contingency Training?
- Stimulus Generalization?
- Response Induction?

So where do we start?
Well, let's start by looking for a generative procedure that does not depend on any of these processes...
The obvious example of such a procedure is provided in Sidman's work on stimulus equivalence.

How do we train it?
How do we assess it?

STIMULUS EQUIVALENCE: SIDMAN (1971)

Where does the productivity of both language and stimulus equivalence come from?
Why does stimulus equivalence occur?
Both language and stimulus equivalence are examples of relating behavior.

RFT explains relating as learned behavior
Overview: Morning

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RFT: Background
- Sidman was using conditional discriminations when he first demonstrated the phenomenon of stimulus equivalence
- So let’s start by looking at training conditional discriminations and subsequent emergent relations

Training Conditional Discriminations

Emergent Relations:
Empirical work has found that, given an equivalence relation (e.g., A-B-C etc.), a psychological function acquired by one member (e.g., A) of that relation may emerge in other members (e.g., B, C) of the relation in the absence of a direct link or a direct learning experience with those other members.

How does RFT explain emergent responding such as stimulus equivalence and language? As arbitrarily applicable relational responding.
Non-Arbitrary Relational Responding

- Same (identity)
- Different (oddity)
- Bigger / Smaller (comparison)

Arbitrarily Applicable Relational Responding

NORMAL: 

Non-Arbitrary Relational Responding

- Physical Relations

Arbitrarily Applicable Relational Responding

Physical Relations

- Opposite to
- Right / left of
- Type / class of
- Analogous to
- Above / below

CONTEXTUAL CUE

Before

- Some of the above is a property?
- What does a property look like?
- What else a property look like?
- Some comparable thing happens?
- Little or no reaction

After

- Some of the above is a property?
- What does a property look like?
- What else a property look like?
- Some comparable thing happens?
- Readily answer questions

GVB in Human Language:
The Jumjaw Experiment

A jumjaw is a dog

Normally developing English speaking adults respond in accordance with a wide variety of contextual cues for arbitrarily applicable relations (AAR)

For example, here are some of the many cues for just the AAR of "sameness" alone

- is the same as
- is equivalent to
- means is equal to
- is parallels
- is similar to
- is like
- is identical to

... RFT suggests that there is a multiplicity of forms of AARR / relational frames

What all frames have in common is that they are generalized contextually controlled patterns of relational responding
Is a jumjaw the same as a cat?
Is a jumjaw bigger than a tractor?
Does a jumjaw have ears?
Which one of these is a jumjaw?
Lassie, Old Smoky, Katrina, Tweety
If I said there was a jumjaw at the back of the room, how would you react?
Do you own a jumjaw?

Exercise: Make up a sentence with the word jumjaw.

For example, let’s look at one or two examples of relations other than equivalence...

- **Comparative Relation:**
  - If I tell you that X is more than Y, then you will derive that Y is less than X (NOT SYMMETRICAL)

- **Opposition Relation:**
  - If I tell you that A is opposite of B and B is opposite of C then you will derive that A is same as C (NOT TRANSITIVE)

Sidman would have described the relations we have just seen as ‘symmetry’ and ‘transitivity’

- Q. Why does RFT use ‘mutual entailment’ and ‘combinatorial entailment’?
- A. ‘Symmetry’ and ‘transitivity’ are fine for equivalence or coordination relations but they do not apply in the case of other types of relations

Overview: Morning

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**What we mean by function**

- Unconditioned Elicited
- Conditioned Elicited
- Discriminative
- Consequential
- Extinction
- Etc.

  - E.g. lemon -> tastes sour
  - E.g. sight of food -> salivation
  - E.g. a red light -> stop
  - E.g. money -> reinforcing
  - E.g. faulty machine -> give up

**Transformation of Functions**

- The property that gives arbitrarily applicable relational responding its psychological significance is the **Transformation of Stimulus Functions**
- If a stimulus has a particular psychological function (e.g., discriminative for a particular action, reinforcing, fear-eliciting, etc.) then in a context that selects that function as appropriate, the functions of related stimuli may also be transformed in accordance with the relation

**Transfer of Functions**

- **RFT uses the term TRANSFORMATION of function rather than TRANSFER of function because it describes many types of relation other than just equivalence (sameness) and, in the case of the latter, functions do not always simply transfer.**
- **FOR EXAMPLE...**

**Transformation vs Transfer**

- RTF uses the term TRANSFORMATION of function rather than TRANSFER of function because it describes many types of relation other than just equivalence (sameness) and, in the case of the latter, functions do not always simply transfer.
- FOR EXAMPLE...

**Transformation of Functions**

Imagine that after our jumjaw example, ‘jumjaw’ produced fear because it was in a derived relation with ‘dog’. However, the level of fear may be a function of the relative size of the ‘jumjaw’ in question.

- “Smaller JJ”
- “Jumjaw”
- “Bigger JJ”

**Transfer of Functions**

- **ALL FRAMES HAVE THREE DEFINING PROPERTIES...**
- Mutual Entailment: looks yellow , produces salivation
- Combinatorial Entailment: looks yellow , makes lemonade, produces salivation
- Transformation of Functions: looks yellow , makes lemonade, produces salivation

**Umbrella**

- Limooo
- Betrang
Overview: Morning

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Developmental origins of AARR

Learning Arbitrarily Applicable Relations

The fundamental conception is as follows:
- All animals that demonstrate complex forms of learning are capable of learning to respond to non-arbitrary relations between stimuli (e.g., smaller than, lighter than)
- However, language-able humans also have a prolonged history of learning to respond to the relations among stimuli where the relations are not defined by the relata but by additional contextual cues
- Learning to name objects is perhaps one of the earliest and most fundamental forms of arbitrarily applicable relational responding

Origins of AARR

- The masses of bi-directional training involved in the parental naming game allow the child to derive the untaught symmetrical relation from the object peach to the name peach without being explicitly trained to do so
- In effect, the word ‘is’, and the naming context more generally, bring the relational frame of sameness (also called co-ordination) to bear on the name peach and the object peach

When children are taught to name objects, they are provided with masses of explicit bi-directional training

After thousands of such interactions, the child no longer requires explicit bi-directional training

Another example

PARENT: "Where is the peach?" (points at novel object)
CHILD: "There"
PARENT: "Good boy!"

"What is this?" (holding peach)
CHILD: "Peach"

Origins of AARR

- Aspects of the context that control responding in the case of stimulus equivalence are the matching-to-sample context itself
- Consider, for example, how many early education exercises involve asking a child which picture ‘is the same as’ or ‘goes with’ a written word
In effect, the matching-to-sample format alone may be able to invoke sameness or equivalence responding in a child with the appropriate history of explicit bi-directional and explicit equivalence training.

Teaching Relational Framing

See Rehfeldt & Barnes-Holmes (2009)

Precursor Skills

- Learner readiness skills
- Observing responses
- Joint attending, social referencing
- Early manding
- Establish conditioned social reinforcers and task completion as a reinforcer

Testing for Relational Precursors and Derived Relations

TARPA

- Section 1 - Basic Discrimination
- Section 2 - Conditional Discrimination (Similarity)
- Section 3.1 - Conditional Discrimination (Non-similarity)
- Section 3.2 - Mutual Entailment
- Section 3.3 - Combinatorial Entailment
- Section 3.4 - Transformation of function
Establishing Initial Frames

• Move from nonarbitrary relations to arbitrary relations

Early Nonarbitrary→Arbitrary Responding

VB-MAPP at Levels 1 and 2: Teaching initial conditional discriminations with physical dissimilarity:

• Listener responding
• Tacting
• Simple Intraverbals
• Association matching

Establishing Initial Frames

• Use standard discrimination training procedures (basic elements of DTT), with a focus on:
  • Bidirectional responding
  • Responding as both speaker and listener

Establishing Initial Frames

Multiple exemplar training, with a focus on:

• Testing for derived relations
• Focus on flexibility of responding
Mutual Entailment

VB-MAPP at higher tasks in Level 2 begins to move towards “untrained” responding and ability to do “reversals”, e.g.:
- T9-d: Learns 2 new tacts without direct training
- IV7-b: Correctly responds to 5 in-context fill-ins when they are reversed (e.g. in your bed you go to...)

MET for Mutual Entailment

- Teach A → B with stimulus set 1
- Test B → A with stimulus set 1
- If no ME, then teach B → A with stimulus set 1
- Teach A → B with stimulus set 2
- Test B → A with stimulus set 2
- etc.

Establishing Combinatorial Entailment

- Combinatorial Entailment by Exclusion
- Combinatorial Entailment by Observation
- B Taylor (2009)
- Remedial Programs
- Multiple Exemplar Training
- Thematic Stimuli
- Fluent Mutual Entailment

Mutual Entailment

- Mutual Entailment Exclusion/Fast Mapping
- Mutual Entailment Observation Dyad
- B Taylor (2009)
- Mutual Entailment Observation Small Group
- Remedial Programs
- Multiple Exemplar Training
- Thematic Stimuli
- Fluent Performance w Trained Relation

Combinatorial Entailment

VB-MAPP at the higher tasks of Level 2 begins to look for “novel responding” and “response generalization”, e.g.:
- T9-e: Shows response generalization for 5 items (i.e. tacts the same stimulus with two different words)
- IV9-f: Provides 5 novel responses to previously acquired questions
- IV10c: Demonstrates 2 untrained intraverbal responses

MET for Combinatorial Entailment

- Teach A → B and C → B with stimulus set 1
- Test C → A / A → C with stimulus set 1
- If no CE, then teach C → A / A → C with stimulus set 1
- Teach A → B and C → B with stimulus set 2
- Test C → A / A → C with stimulus set 2
- etc.
Establishing Initial Frames

- Train/test for transformation of function

Establishing Other Frames

Consistent relational cues:

- Focus on the specific relation to be targeted (same, name, goes with, part of, category, etc.)
- Establish the relational cue across stimulus sets
- Mixing of trials involving different relations

Relational Cues

ALL FRAMES HAVE THREE DEFINING PROPERTIES...

1. Mutual Entailment
2. Combinatorial Entailment
3. Transformation of Functions

... RFT suggests that there is a multiplicity of forms of AARR / relational frames
Establishing Relational Frames

For all frames:
- Teach responding as speaker and listener
- Teach bidirectional relations between stimuli
- Focus on flexibility—the relation is key, not stimulus items, method of presentation, etc.
- Move between nonarbitrary and arbitrary relations
- Test for mutual entailment, combinatorial entailment, transformation of function
- Teach multiple examples of relations

Frames of Comparison

- Bidirectional relations: if this is bigger, then that is smaller
- Flexibility: sometimes this is bigger, and sometimes this is smaller
- Move from nonarbitrary to arbitrary: tact-->intraverbal, or nonphysical comparisons (e.g. value)
- Test for ME, CE, ToF

Frames of Opposition

- Bidirectional relations: if this is the opposite of that, then that is the opposite of this
- Move from nonarbitrary to arbitrary
- Test for ME, CE, ToF; increase flexibility of responding; Barnes-Holmes et al.

Spatial Relations

- Bidirectional relations: object to base AND base to object
- Flexibility: items in different relations, base/object reversals
- Move from nonarbitrary to arbitrary
- Test for transformation of function

Summary: Core RFT Concepts
Relational Frames

- Coordination
- Distinction (same/different)
- Opposition
- Comparison
- Spatial Relations
- Hierarchy
- Perspective Taking (Deictic)

Moran, Stewart, McElwee & Ming (2010)

Compared TARPA with Vineland Adaptive Behavior Scale (VABS) in 5 children with ASD

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VABS Composite  $r = 0.97$  $p = 0.05$
Communication  $r = 0.947$  $p = 0.056$
Daily Living  $r = 0.56$  $p = 0.25$
Socialization  $r = 0.56$  $p = 0.25$

TARPA correlates strongly with communication

Moran, Stewart, McElwee & Ming (In prep)

Compared TARPA with Preschool Language Scale-4th Ed. (PLS-4), a mainstream language assessment, in 8 children with ASD

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PLS-4 Composite  (r = 0.99, p = .014)

TARPA shows strong correlation with standard language tests

Cassidy, Roche & Hayes (2011)

Study 1: Typically developing 8-12 year olds
Training Group received SAME, SAME & OPPOSITE and MORE & LESS M.E.T. across a period of 24 months

Figure 2: Data for Individual Participants in Training and Control Groups

Moran, Stewart, McElwee & Ming (2010)

Study 2: Eight 11-12 year olds with educational difficulties
Received 6-14 weeks training in SAME, SAME & OPPOSITE and MORE & LESS M.E.T. across a period of 9 calendar months

Cassidy, Roche & Hayes (2011)
Summary: Integrating RFT into VB Programs

1. Focus less on content and quantity (increasing trained conditional discriminations), and more on establishing relational frames (establishing derived relational responding).
2. Test for derived relations as key indicators of “generalizing across operands”, “response generalization”, etc.

Summary: Integrating RFT into VB Programs

1. Problem-solve acquisition problems using your understanding of precursor skills, relational framing precursors, and relational frames.
   - Identify the relational frame you are trying to teach.
   - Within each frame, move from nonarbitrary to arbitrary (and back again as needed).
   - Focus on bidirectional responding; use MET for the pattern of responding, not just examples of stimuli.
   - Use consistent relational cues.

A Final Note

1. HAVE FUN!

Download this presentation and other materials at:
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