



# UPDATING RELATIONAL FRAME THEORY AND INCREASING ITS UTILITY IN APPLIED BEHAVIOR ANALYSES OF HUMAN LANGUAGE AND COGNITION



DERMOT BARNES-HOLMES, COLIN HARTE, JOÃO H. DE ALMEIDA &  
CAROLINA SILVEIRA



Dermot Barnes-Holmes



Colin Harte



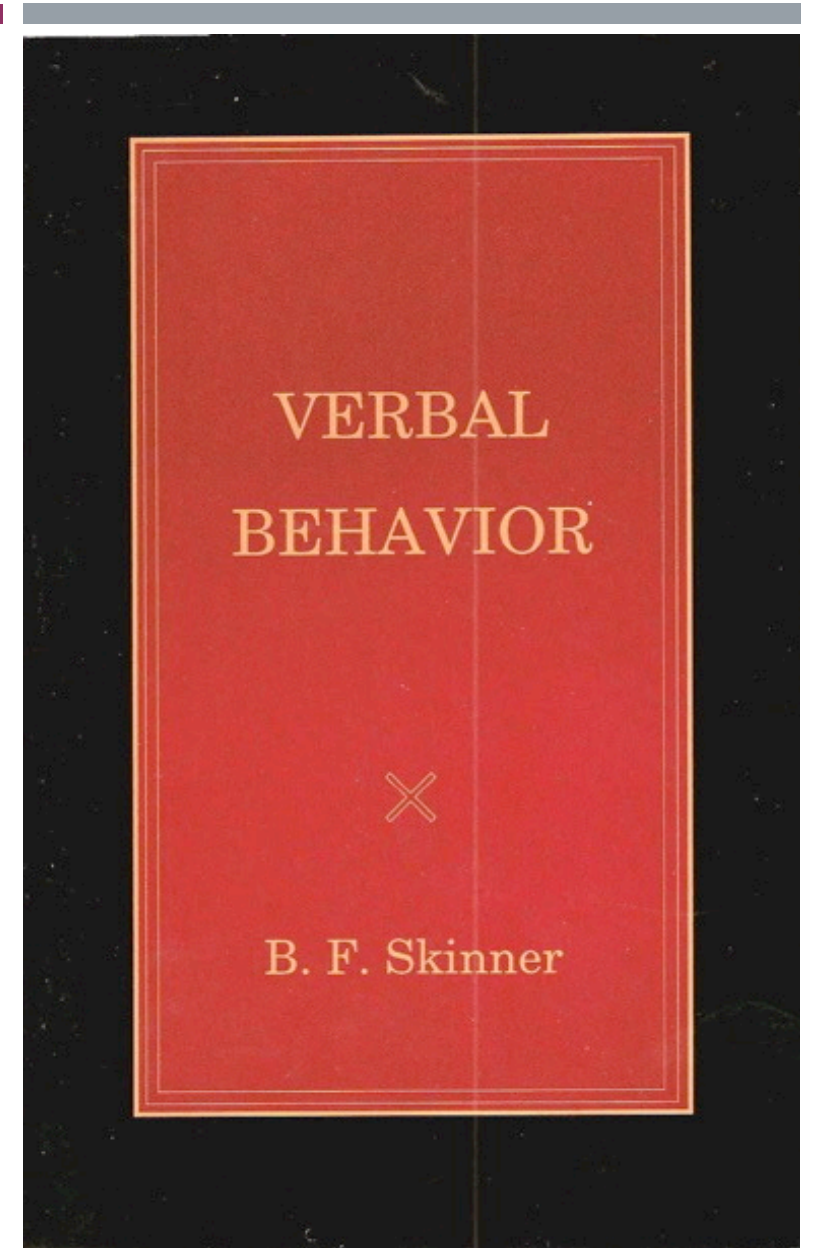
Joao H. de Almeida



Carolina Silveira

# WHAT IS RFT? A BRIEF HISTORY

- First major behaviour analytic treatise on human language
  - Largely a work of interpretation
  - Limited basic research but influential in remediating language deficits
  - Examples of derived relations appear but constrained by methodology and empirical work at that time



# A DECADE LATER...

- Skinner proposes the concept of rule-governed behavior
  - Rule-governed behavior distinguished from direct control by contingencies
  - Rules specify contingencies, which circumvents the need to contact contingencies directly
  - Produces many basic research studies, particularly related to “schedule insensitivity effects” in verbal humans

## An operant analysis of problem solving

B. F. Skinner

Department of Psychology and Social Studies, Harvard University  
Cambridge, Mass. 02138

**Abstract.** Behavior that 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. Behavior solving typically involves the construction of discriminative stimuli. Verbal responses produce especially useful stimuli, because they allow other people to construct discriminative stimuli (rules, programs, and so on), so that behavior can be modified without direct or prolonged contact with the contingencies that reinforced the behavior when problems first occurred, and also to by transmitting the verbal discriminative stimuli called rules, programs, and so on. The construction of such a set of problem-solving behavior that solves a problem may result from direct shaping by reinforcement or from rule-governed control by the problem solver's behavior. Because different controlling verbal forms (rules, programs, and so on) are used to solve exactly the same problem, the distinction must make account of (1) a system which establishes certain contingencies of reinforcement, such as some part of the verbal discriminative stimuli or program, as a verbal contingency; (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 controlled by the rules.

**Keywords:** response-shaped behavior, behavior, discriminative stimuli, feedback, behavior, 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 usually identified in a typical problem-solving process. First, a problem is recognized and analyzed. The response previously reinforced with food to solve it no longer changes the situation until the change is properly called. Second, the behavior which brings about the change is properly called. In solving and the response it produces a solution, a question for which there is at the moment no answer is also a problem. It may be solved by producing a verbal rule, by constructing a verbal program, or by solving in any way which leads to reinforced behavior. However, it is not clear how to describe a problem-solving process which is not related to the solving of some problem, or whether the analysis of behavior would coincide with an analysis of behavior as a whole.

### Contingencies of reinforcement

When a response occurs and is reinforced, the probability that it will occur again in the presence of similar stimuli is increased. The process no longer proceeds any great distance from verbal responses to contingencies, but problems arise when contingencies are complex. For example, in Thorndike's experiment the probability that the rat would turn the lever was at first quite low. The low initial reinforcement and reinforcement were behavior, that is, it was reinforced with turning the lever, and reinforced responses which may have made the lever turn. Reinforcing when it was eventually reached. The learned performance which satisfied the contingencies was a

class of responses consisting toward and approaching the lever, reaching and turning the lever, entering toward and passing through the opening door, and approaching and raising the lever. Some trials in the chain may have been reinforced by the food and others by escape from the box, but none could be reinforced only after other behaviors had been reinforced. For these and other reasons the rat perceived a problem—the food the rat had Thorndike.

Thorndike thought he solved his problem by using the reinforced rat food and escape behavior. The response is reinforced. The rat's response that a response has already been affected by reinforcement is not a "verbal response" / program in behavior which behavior has been selected in the condition of the species because it has brought escape from comparable situations or has been reinforced by escape from previous situations during the life of the rat. The term "rule" does not describe behavior. It gives judgment on it. The rat's response that a response has already been affected by reinforcement and every other do not represent any verbal property of behavior — certainly not a single problem-solving problem solving. The changes which contribute to such a verbal include the acquisition and extinction of operant responses, the conditioning of responses, and the extinction of unconditional responses. Any contribution made by an increase in the probability of the reinforced response is indirectly obtained.

Even in Thorndike's rather crude apparatus it should be possible to obtain the changes resulting from reinforcement. We could begin by adjusting the rat to the box with reinforced responses when it was hungry. By giving the food repeatedly before reaching the lever the rat

# A DECADE LATER...

- Skinner proposes the concept of rule-governed behavior
  - Also many studies on the impact of rules per se (e.g., rules that specify the contingencies versus performance)
  - Recognized that rule-governed behavior may be beneficial in problem solving but may come at a cost
  - Also, some researchers asked how do rules specify contingencies?

## An operant analysis of problem solving

B. F. Skinner

Department of Psychology and Social Studies, Harvard University  
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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 self-reinforcing when it does so. Problem solving typically involves the construction of discriminative stimuli. Such responses produce especially useful stimuli, because they allow other people to construct discriminative stimuli (rules, programs, and so on), or sometimes behave more effectively without direct or proximal contact with the contingencies that produced them. The solver solves problems for its own sake, and does so by constructing the verbal discriminative stimuli called rules, programs, decisions, and the construction of such is one aspect of problem solving. Behavior that solves a problem may result from direct shaping by contingencies that make instrumental action by the problem solver by others. Because different controlling variables are involved, contingencies that solve a problem are more complex than rule-governed behavior. The distinction and value among (1) a system which establishes certain contingencies of reinforcement, (2) a verbal rule or program of reinforcement, or (3) a verbal stimulus, which specifies the behavior shaped and maintained by these contingencies, (4) rules, derived from the contingencies, which specify discriminative stimuli, responses and consequences, and (5) the behavior specified by the rules.

**Keywords:** contingencies-shaped behavior, behavior, discriminative stimuli, feedback, behavior, 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 self-reinforcing when it does so. Two stages are easily identified in a typical problem-solving process. First, the solver constructs a verbal stimulus which specifies the contingencies that will maintain the behavior which solves the problem. This behavior which brings about the change in properly called problem solving and the response it produces a solution. A question for which there is at the moment no answer is also a problem. It may be solved by producing a verbal stimulus, by constructing a solution, or by acting in any way which brings about a stimulus which is self-reinforcing. There are a number of verbal stimuli and programs which are not related to the solving of some problem, or which are not verbal stimuli which would coincide with an analysis of behavior as a whole.

### Contingencies of reinforcement

When a response occurs and is reinforced, the probability that it will occur again in the presence of similar stimuli is increased. The process no longer presents any great problem for verbal responses or contingencies, but problems arise when contingencies are complex. For example, in Thorndike's experiment the probability that the rat would turn the lever was at first quite low. The low initial reinforcement and unconditional reward behavior, most of it inseparable with turning the lever, and occasional responses which may have made the lever turn following when it was eventually reached. The learned performance which satisfied the contingencies was a

class of responses consisting toward and approaching the lever, standing and turning the lever, standing toward and passing through the opening door, and approaching and raising the lever. Some trials in the chain may have been reinforced by the food and others by escape from the box, but none could be reinforced only after other responses had been conditioned. For these and other reasons the rat has perceived a problem—the food is not out there.

Thorndike thought he solved his problem by acting like the rewarded rat (and other rats). The response is self-reinforcing. "The" implies that a response has already been affected by reinforcement. It is not a "verbal response" / program in behavior which refers to the condition of the situation of the species because it has brought escape from comparable situations or has been reinforced by escape from previous situations during the life of the rat. The term "rule" does not describe behavior. It gives judgment on it. The rat may be trained never to turn the lever by Thorndike and every other rat not exposed any verbal properties of behavior - controls not a single program called problem solving. The changes which contribute to such a system include the adaptation and extinction of emotional responses, the conditioning of emotions, and the extinction of unconditional responses. Any contribution made by an increase in the probability of the rewarded response is functionally obscured.

Even in Thorndike's rather crude apparatus it should be possible to make the change resulting from reinforcement. We could begin by adjusting the rat to the low initial reinforced response when a lever is depressed. By opening the door repeatedly (with making sure that the event

# FIVE YEARS LATER...



- Sidman offers an answer...
  - Equivalence relations provide a functional-analytic definition of symbolic relations (i.e., specification)
  - The importance of Sidman's discovery is recognized immediately, but the conceptual implications emerge gradually through the 1970's, culminating in the 1982 "primates fail symmetry tests" JEAB article
  - A series of written exchanges between Sidman and Willard Day reveal that the idea of equivalence relations as symbolic relations was controversial...

# DURING THE MID 80S



## RULE- GOVERNED BEHAVIOR

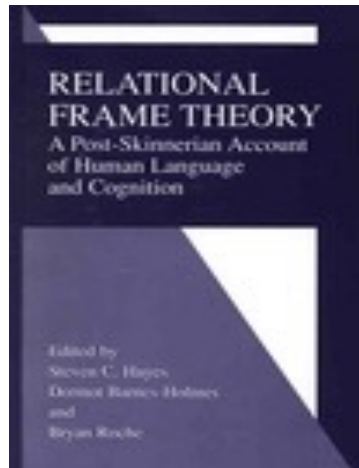
COGNITION,  
CONTINGENCIES,  
AND  
INSTRUCTIONAL  
CONTROL

Edited By  
Steven C. Hayes

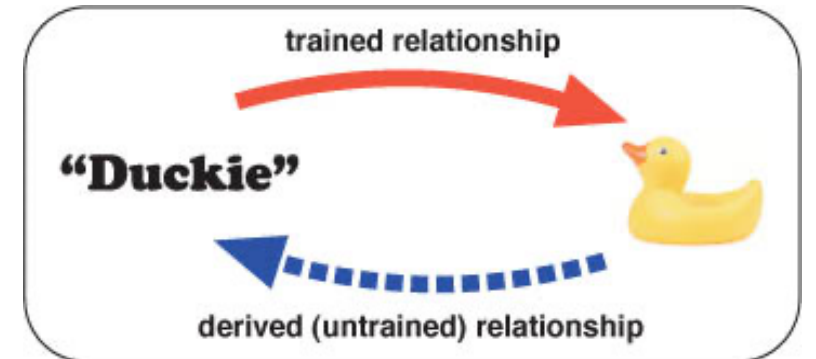
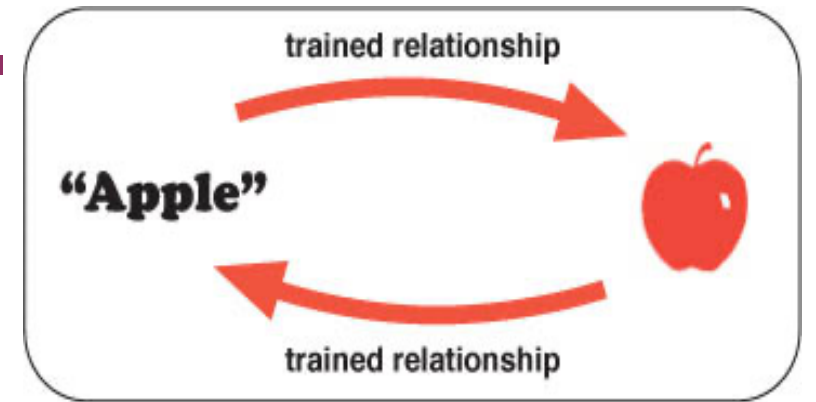
- Hayes argued that equivalence is a generalized relational operant
  - These operants are typically established through natural language interactions
  - Many such operants or “relational frames” are possible
  - Relational frames combine into networks of relations to form rules or instructions
  - Basic account presented across two chapters in 1989 book on Rule-Governed Behavior...

# RFT BOOK IN 2001

- RFT presented as a behaviour-analytic account of human language and cognition (not just rules)



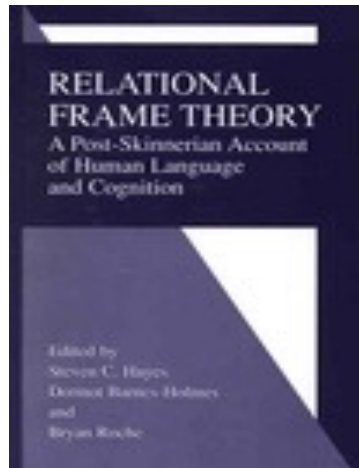
- Core operant process is named arbitrarily applicable relational responding (AARR)
- AARR as a generalized operant is learned and consists of **mutually entailed relations...**



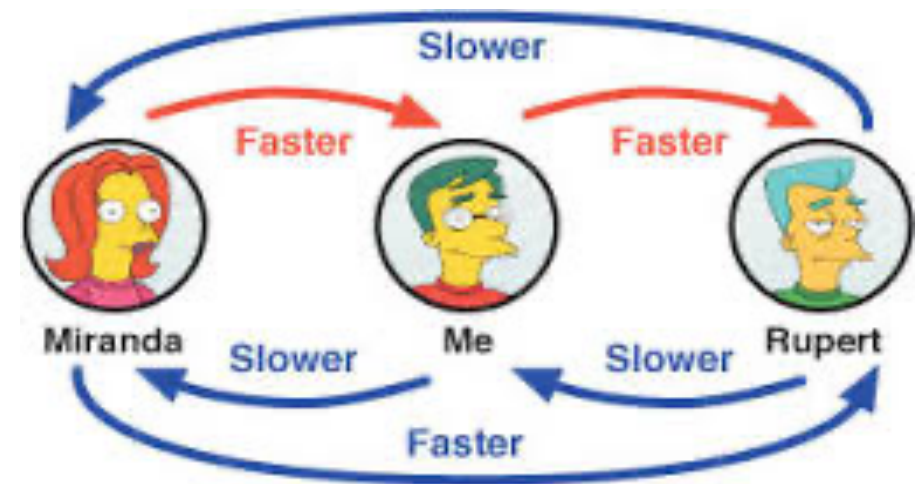
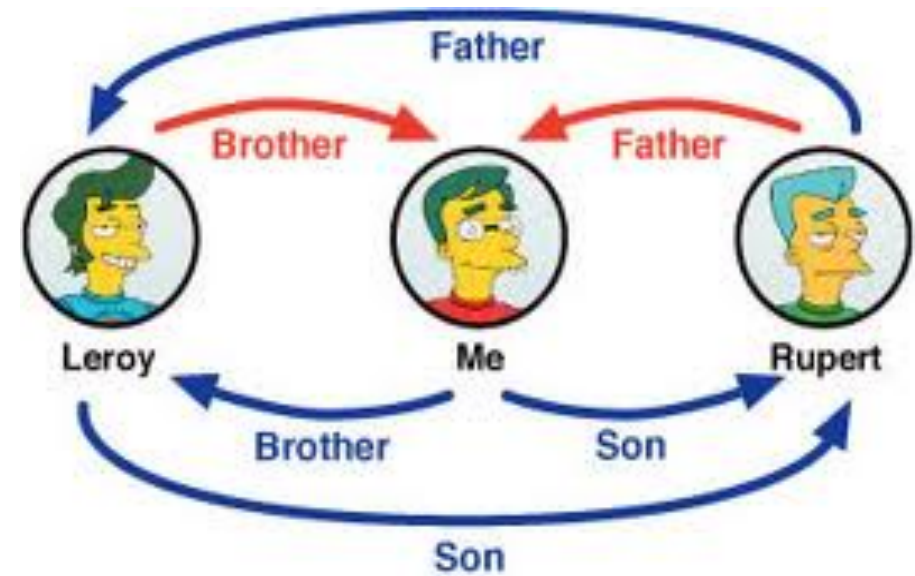


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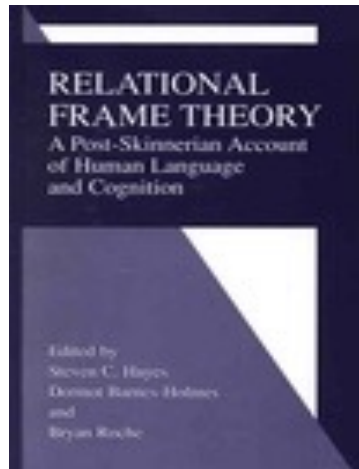


- Core operant process is named arbitrarily applicable relational responding (AARR)
- AARR as a generalized operant is learned and consists of **relational frames**...

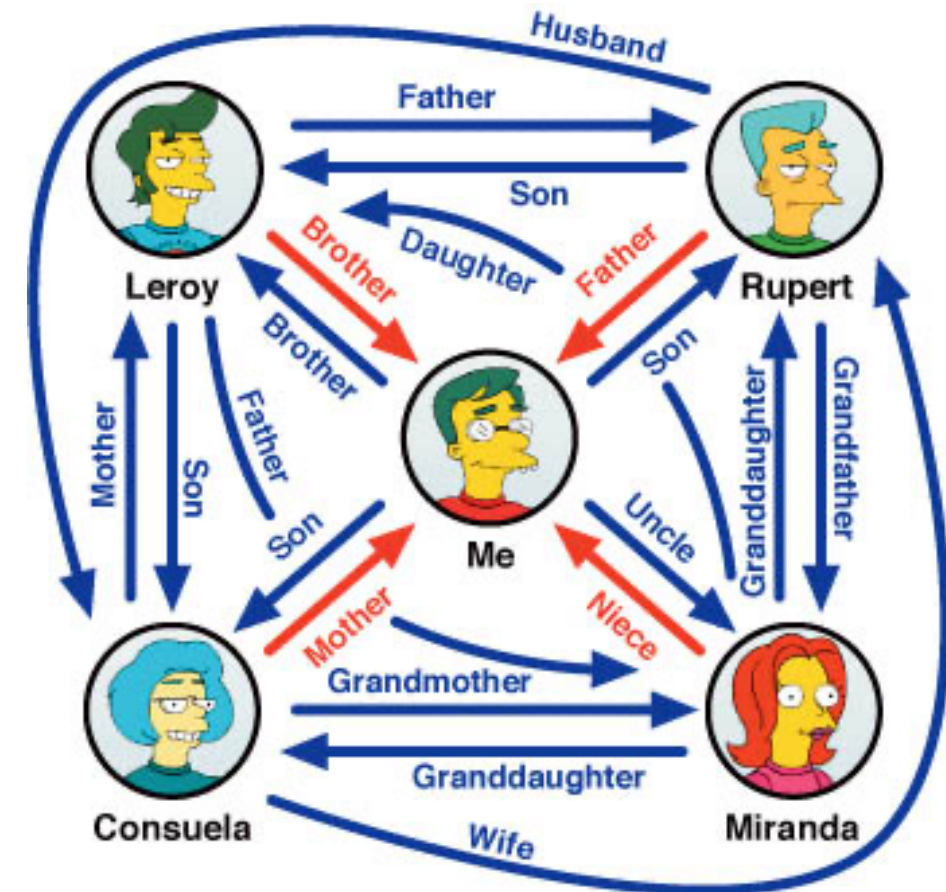


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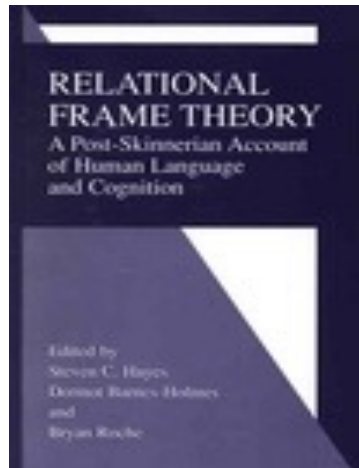


- Core operant process is named arbitrarily applicable relational responding (AARR)
- AARR as a generalized operant is learned and consists of (complex) **relational networks...**



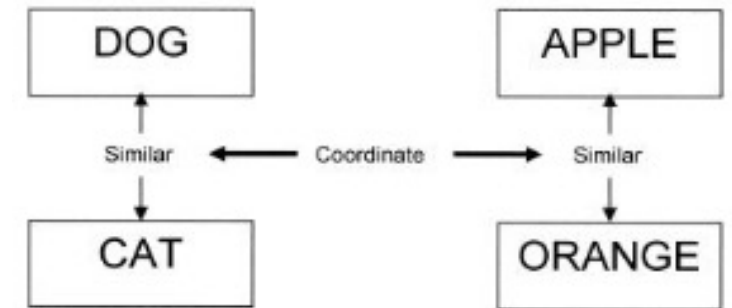
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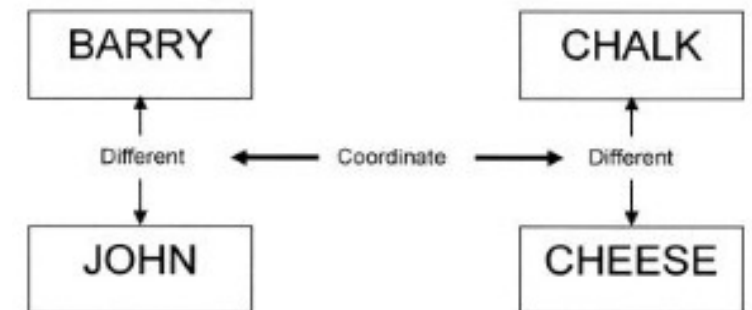


- Core operant process is named arbitrarily applicable relational responding (AARR)
- AARR as a generalized operant is learned and consists of **relating relations...**

## Similar - Similar

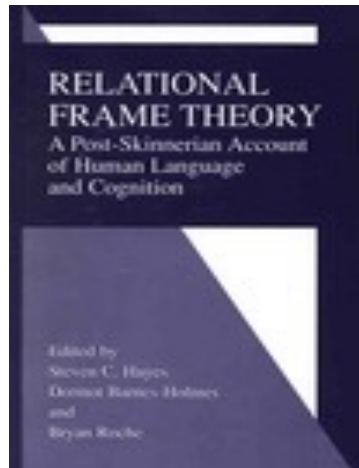


## Different - Different

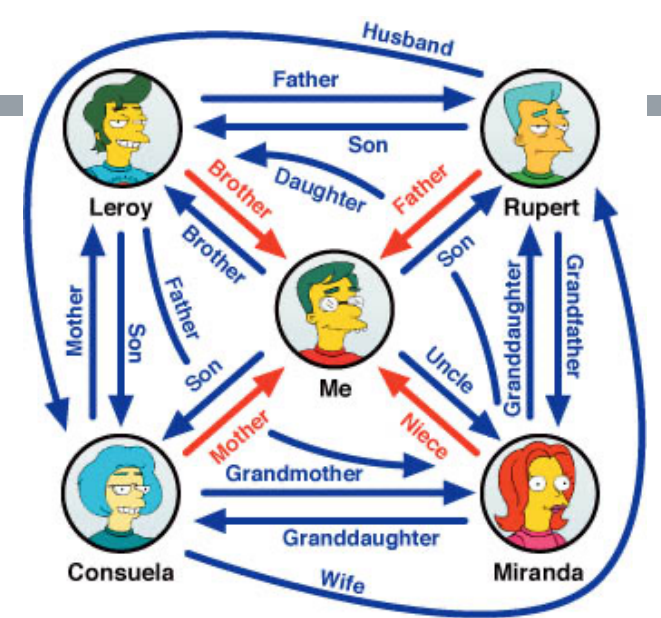


# RFT BOOK IN 2001

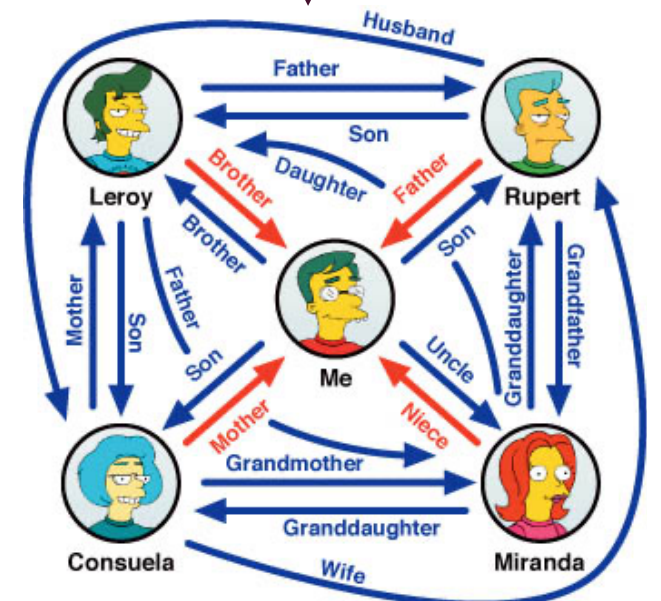
- RFT presented as a behaviour-analytic account of human language and cognition (not just rules)



- Core operant process is named arbitrarily applicable relational responding (AARR)
- AARR as a generalized operant is learned and consists of **relating relational networks...**

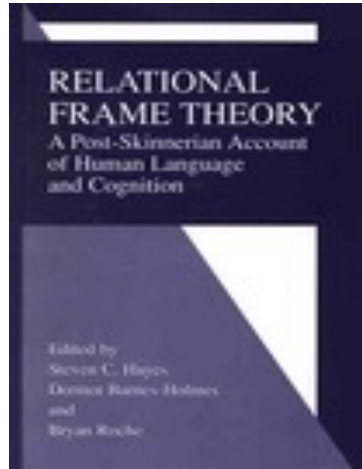


Coordinate



# RFT BOOK IN 2001...

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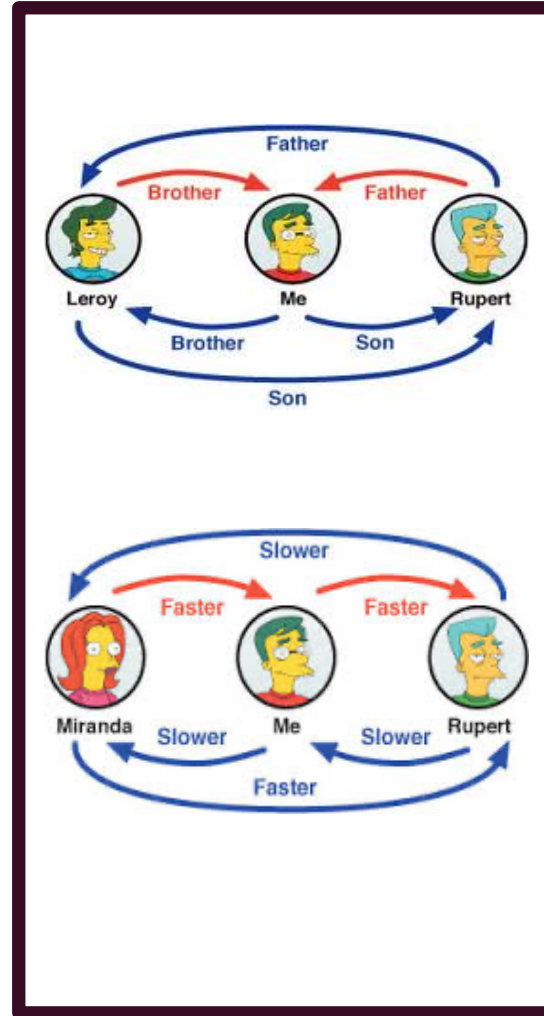


- Core operant process is named arbitrarily applicable relational responding (AARR)
- AARR as a generalized operant is learned and consists of relating relational networks of increasing complexity...

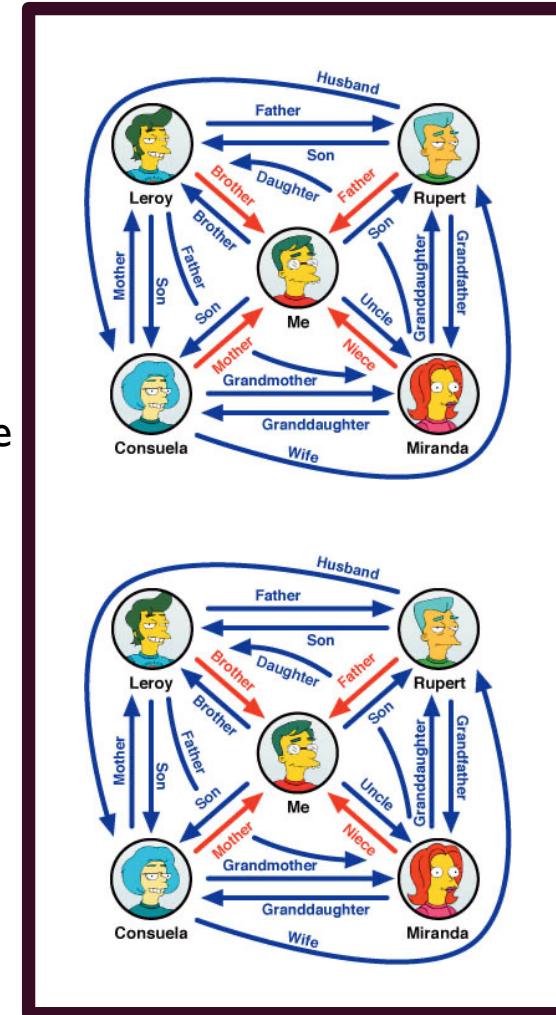
## A Hierarchical Network of Relational Networks

Small Networks

Large Networks



Comparative



# Q&A





Empirical Research

From the IRAP and REC model to a multi-dimensional multi-level framework for analyzing the dynamics of arbitrarily applicable relational responding\*



Dermot Barnes-Holmes<sup>a,\*</sup>, Yvonne Barnes-Holmes<sup>a</sup>, Carmen Luciano<sup>b</sup>, Ciara McEntegart<sup>a</sup>

<sup>a</sup> Ghent University, Ghent, Belgium  
<sup>b</sup> University of Almería, Almería, Spain

ARTICLE INFO

ABSTRACT

**Keywords:**  
Relational frame theory  
Multi-dimensional  
Multi-level  
Dynamics  
Arbitrarily applicable relational responding

The article presents the beginnings of a conceptual framework for analyzing the dynamics of arbitrarily applicable relational responding (AARRing). The framework focuses on the dimensions and levels of AARRing that have been the focus of empirical and conceptual analysis in the literature on relational frame theory over the past 30 years. The name of the framework is abbreviated the MDML, and the conceptual and empirical context from which it emerged is presented. The framework currently consists of four dimensions, (i) coherence, (ii) complexity, (iii) direction, and (iv) flexibility; and five levels of relational development, (i) mutual matching, (ii) relational framing, (iii) relational networking, (iv) relating relations, and (v) relating relational networks. Within the MDML, each of the dimensions intersects with each of the levels, yielding 20 potential units of behavioral analysis, defined as functional-analytic descriptive relational quanta (abbreviated as FAARQs). Some of the conceptual and empirical implications of the MDML are considered, focusing in particular on how it highlights the dynamic properties of AARRing. Specific examples of how the MDML is (and may) impact upon research in relational frame theory are also presented.

A brief outline of the multi-dimensional multi-level framework for analyzing the dynamics of arbitrarily applicable relational responding (AARRing) was provided in a recent chapter, which functioned as an introduction to a section on relational frame theory (RFT) in the Wiley Handbook of Contextual Behavioral Science (Barnes-Holmes, Barnes-Holmes, Hursey, & Luciano, 2016). In that chapter, we argued that the proposed framework would provide a context for analyzing the dynamics of AARRing by conceptualizing such behavior in terms of multiple dimensions and multiple levels, and abbreviated the name of the framework, the MDML.<sup>1</sup> The key purpose of the current article is to present a more detailed or elaborate view of the MDML than was presented in the chapter of the recent handbook. In so doing, it should be clear that we are not seeking to replace RFT with something fundamentally new or different. Rather, we hope to focus on and extend those features of the original theory that appear to us to be the most important at the current time, but perhaps have remained somewhat underemphasized in much of the early work on RFT. What we present here,

therefore, is not an alternative to RFT as presented in the seminal volume (Hayes, Barnes-Holmes, & Roche, 2001), but an extension focusing on those features of the theory that seem to us to be most in need of emphasis as we move forward with the retinalating model of basic and applied science that serves to characterize contextual behavioral science itself (see Hayes, Barnes-Holmes et al., 2012).

1. What is the MDML and what does it offer?

At this point in an earlier version of the current paper we first presented the historical background to the MDML before describing the framework itself and explaining why we think it may be a useful tool within contextual behavioral science and perhaps beyond. During the review process, however, it became clear that it was important to begin with a basic outline of the MDML and to provide at least one or two examples of the motivation behind its development. Adopting this strategy requires that the reader who is unfamiliar with the MDML

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\* Correspondence to: Department of Experimental, Clinical, and Health Psychology, Ghent University, Herestraat 49, 9000 Ghent, Belgium.  
E-mail address: Dermot.Barnes-Holmes@ugent.be (D. Barnes-Holmes).  
<sup>1</sup> As explained in greater detail later in the paper, the term “dimensional” refers to the ways in which the units of analysis, created by the intersections between the levels and dimensions specified within the MDML, interact with each other.

# A FRAMEWORK FOR RFT

- 2017 and beyond: A multi-dimensional, multi-level (MDML) framework for analysing the dynamics of AARR
- On balance, the domain of human language and cognition is far from simple and behavior analysts have been grappling with it since the 1950s
- A single overarching framework that summarizes how RFT is approaching the experimental analysis of human language and cognition reveals the challenge we face...

# THE MULTI-DIMENSIONAL, MULTI-LEVEL (MDML) FRAMEWORK

<b>Levels</b>	<b>Dimensions</b>			
	<i>Coherence</i>	<i>Complexity</i>	<i>Derivation</i>	<i>Flexibility</i>
<i>Mutual Entailing</i>	Coh/Mut-Ent	Cpx/Mut-Ent	Dev/Mut-Ent	Flx/Mut-Ent
<i>Relational Framing</i>	Coh/Frame	Cpx/Frame	Dev/Frame	Flx/Frame
<i>Relational Networking</i>	Coh/Net	Cpx/Net	Dev/Net	Flx/Net
<i>Relating Relations</i>	Coh/Rel-Rel	Cpx/Rel-Rel	Dev/Rel-Rel	Flx/Rel-Rel
<i>Relating Relational Networks</i>	Coh/Rel-Net	Cpx/Rel-Net	Dev/Rel-Net	Flx/Rel-Net



# COHERENCE

- **Coherence** refers to the extent to which a pattern of derived relational responding coheres with previously established patterns of such responding.
- For example, if an individual is told that stimulus A is larger than B, and is subsequently told that stimulus B is smaller than A, the latter statement would likely be deemed coherent with the former.
- In this instance, coherence would be relatively high because the overall pattern ( $A > B = B < A$ ) coheres so consistently with the way in which such verbal relations have been established by the wider verbal community
- I.e., there are few instances in which the statement, “if A is bigger than B, then B is bigger than A” would be reinforced, or not punished/corrected, by an English-speaking listener).

# COMPLEXITY

- **Complexity** refers to the intricacy or density of a pattern of derived relational responding including differing levels of complexity in contextual control
- For example, all things being equal;
  - if  $A = B$  then  $B = A$  involves only one relation,
  - $A > B$  then  $B < A$  involves two relations,
  - If  $A = B$  and  $B = A$  on the basis of color involves only one contextual dimension,
  - If  $A = B$  and  $B = A$  on the basis of color and shape involves two contextual dimensions,
  - If  $A = B$  and  $B = A$  on the basis of an arbitrary cue (e.g., “is a”) likely involves a more extensive (complex) history than (simple) non-arbitrary contextual control; note also that arbitrary cues require low levels of (simple) orienting responses.

# DERIVATION

- **Derivation** refers to the extent to which a particular pattern of derived relational responding has previously been emitted or “practiced.”
- Within the new framework, each time a relation is derived its level of derivation reduces because it acquires its own history that extends beyond the derivation that is made from the “baseline” relation;
  - If an individual learns that A is bigger than B, and thus derives that B is smaller than A, the first time that the  $B < A$  relation is derived it is derived “directly” from the  $A > B$  “baseline” relation.
  - However, if the individual subsequently continues to respond to B as smaller than A, that relational response gradually acquires its own history that renders it less and less derived from the original baseline relation (i.e., A bigger than B).

# FLEXIBILITY

- **Flexibility** refers to the extent to which a particular pattern of derived relational responding may be modified by a contextual variable.
- E.g., when playing a game of “**give me the wrong answer**” tell me what  $2 \times 2$  equals... (4) as quickly as you can?

# THE MDML FRAMEWORK

<b>Levels</b>	<b>Dimensions</b>			
	<i>Coherence</i>	<i>Complexity</i>	<i>Derivation</i>	<i>Flexibility</i>
<i>Mutual Entailing</i>	Coh/Mut-Ent	Cpx/Mut-Ent	Dev/Mut-Ent	Flx/Mut-Ent
<i>Relational Framing</i>	Coh/Frame	Cpx/Frame	Dev/Frame	Flx/Frame
<i>Relational Networking</i>	Coh/Net	Cpx/Net	Dev/Net	Flx/Net
<i>Relating Relations</i>	Coh/Rel-Rel	Cpx/Rel-Rel	Dev/Rel-Rel	Flx/Rel-Rel
<i>Relating Relational Networks</i>	Coh/Rel-Net	Cpx/Rel-Net	Dev/Rel-Net	Flx/Rel-Net

# Q&A





MAKING THE ABSTRACT  
MORE CONCRETE



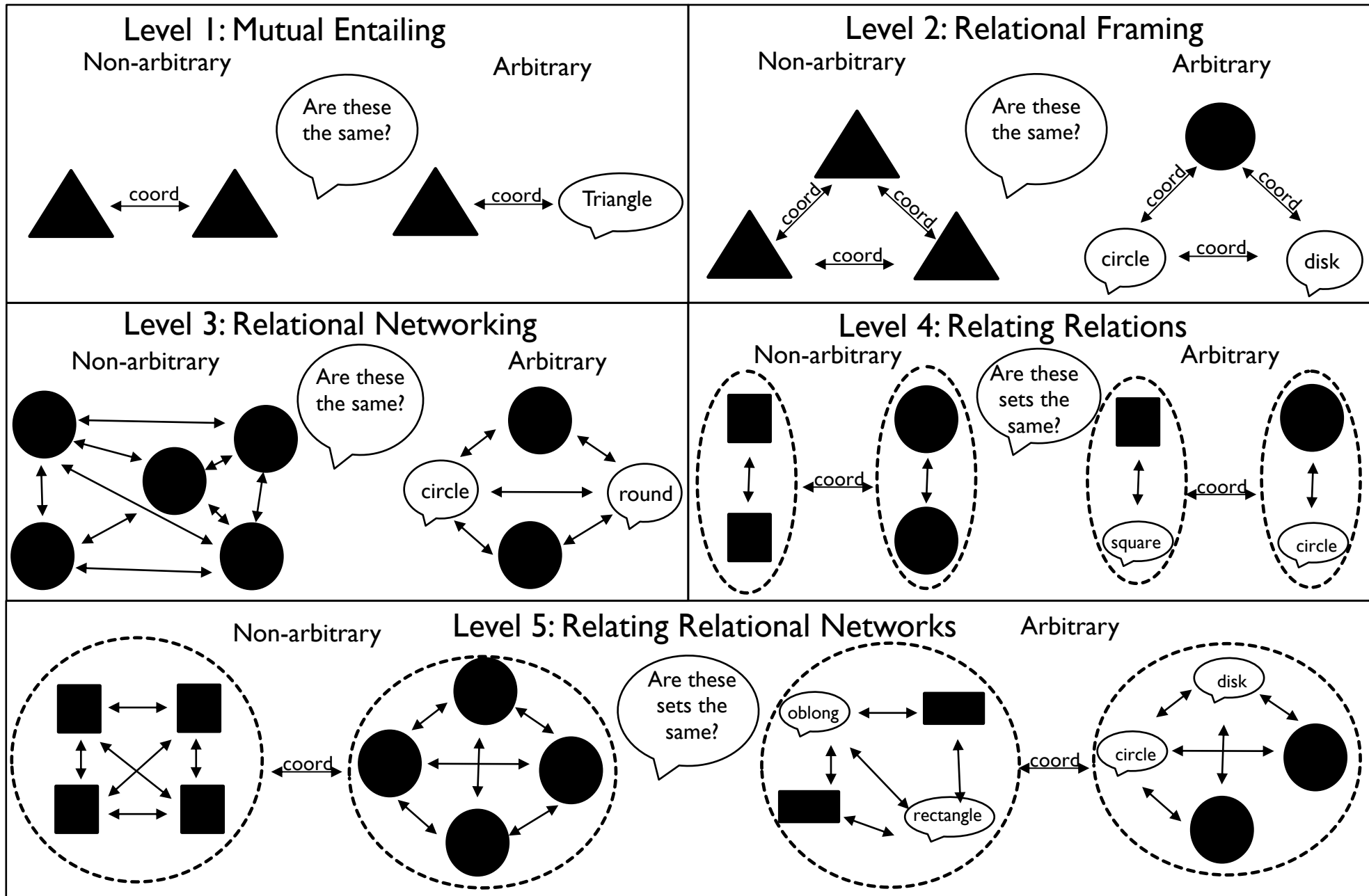
PRACTICAL  
IMPLICATIONS  
FOR ABA



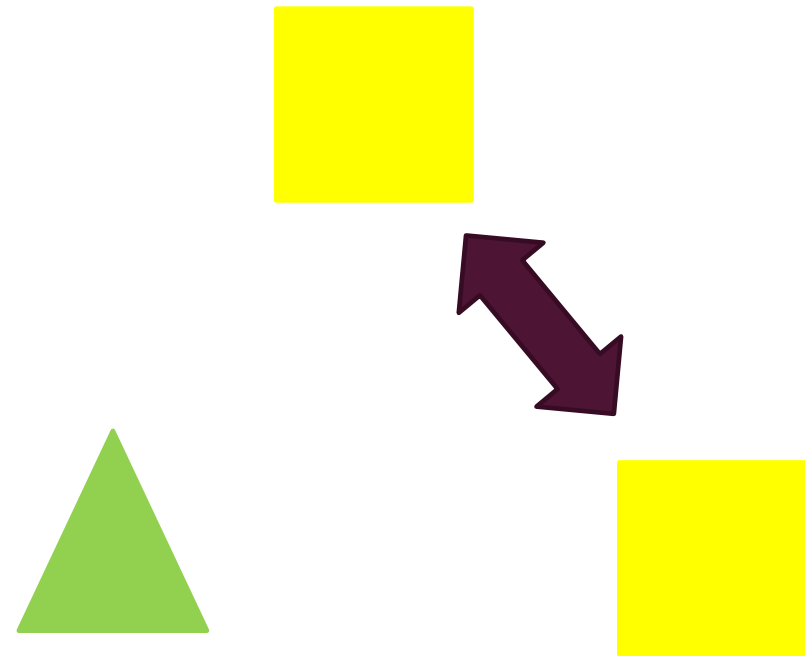
# COORDINATION



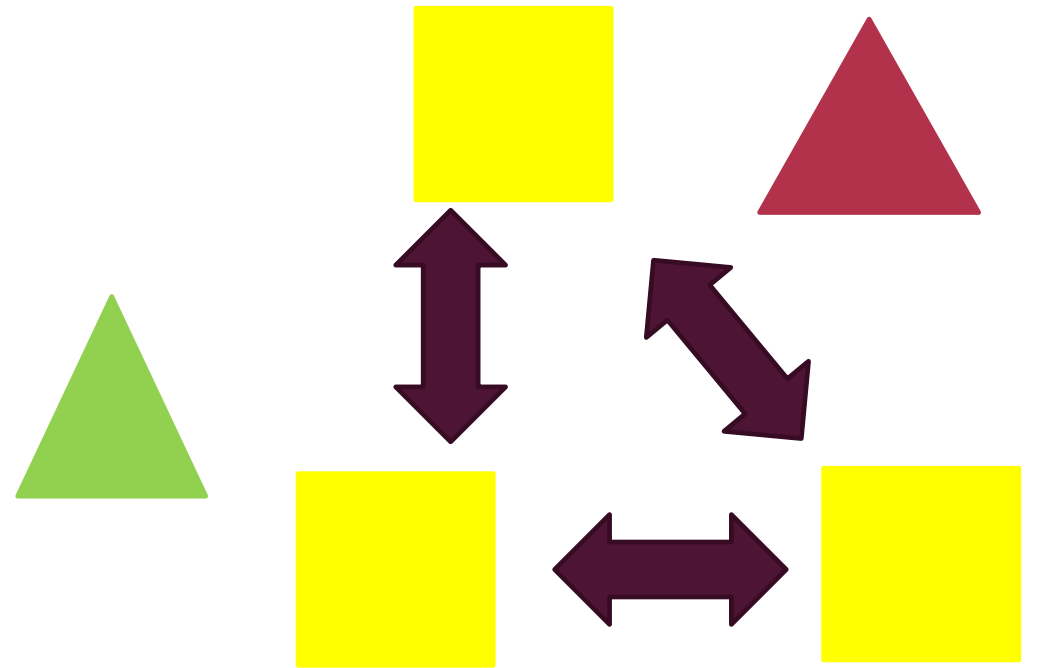




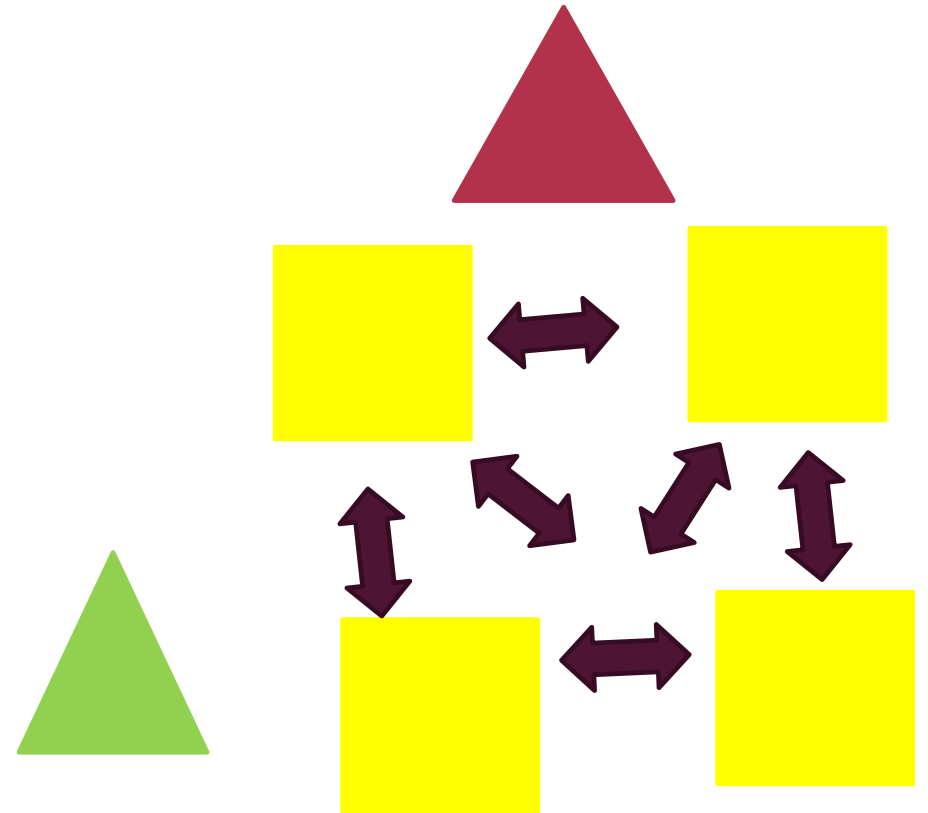
# LEVEL I – COORDINATION (NON ARBITRARY RELATIONS)



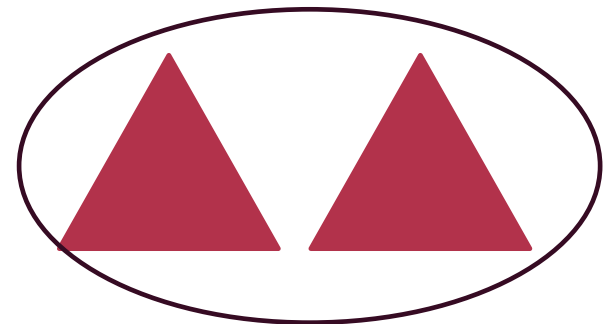
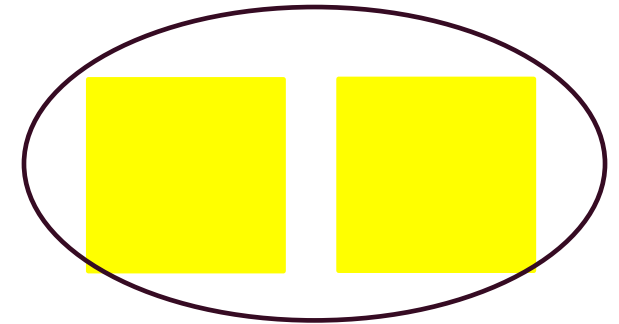
## LEVEL 2 – COORDINATION (NON ARBITRARY RELATIONS)



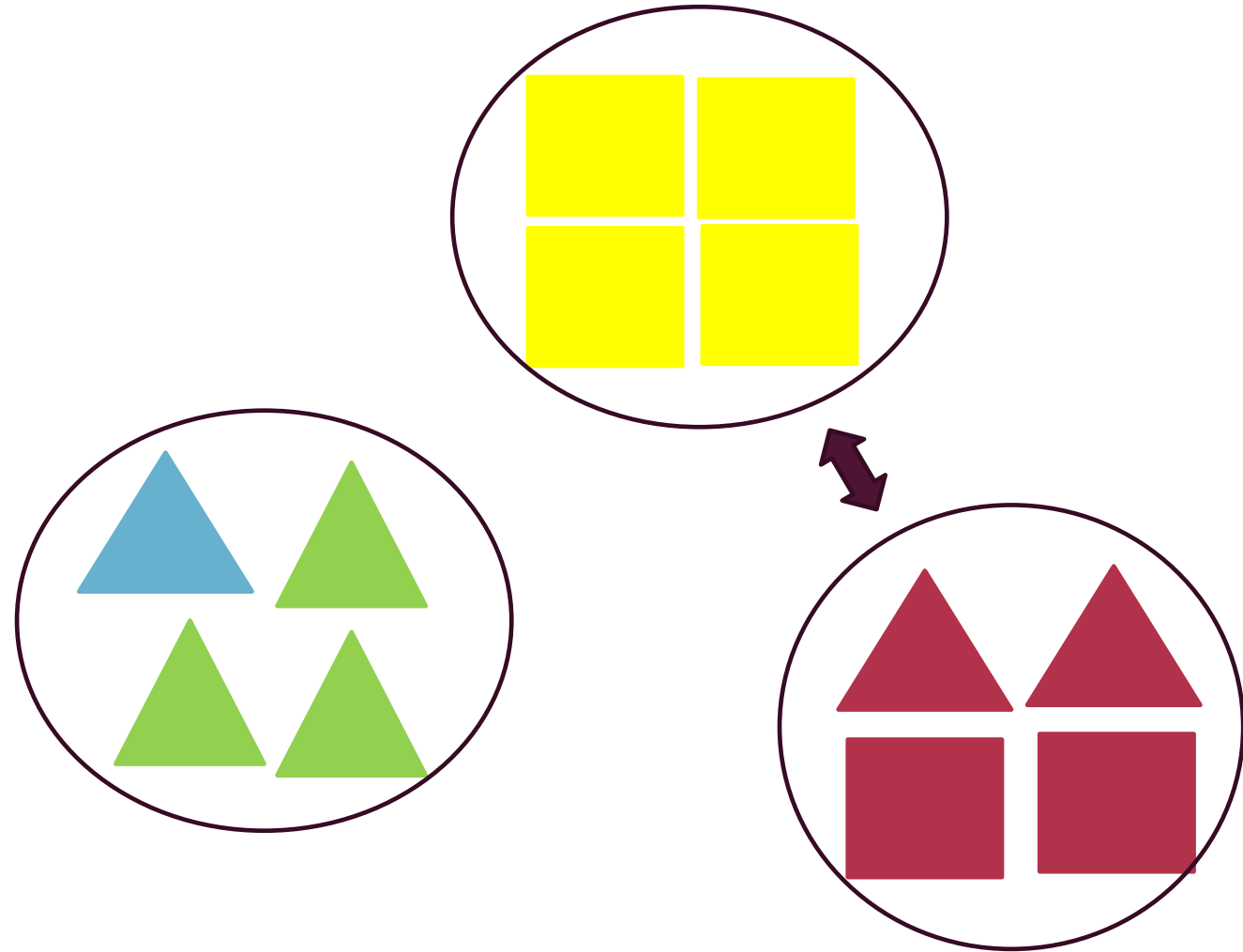
## LEVEL 3 – COORDINATION (NON ARBITRARY RELATIONS)



## LEVEL 4 – COORDINATION (NON ARBITRARY RELATIONS)



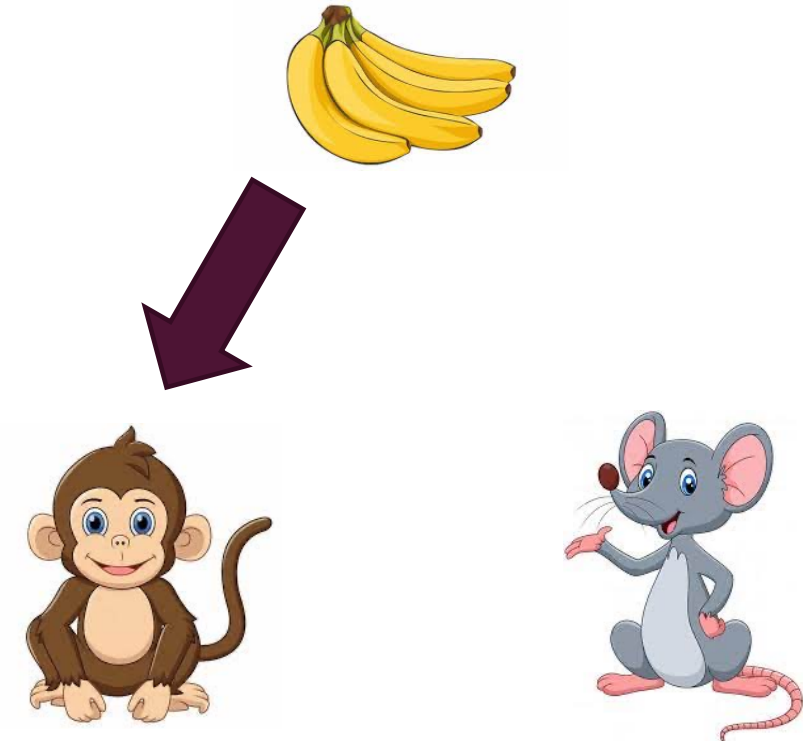
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# LEVEL I – COORDINATION (ARBITRARY RELATION) TRAINING AB

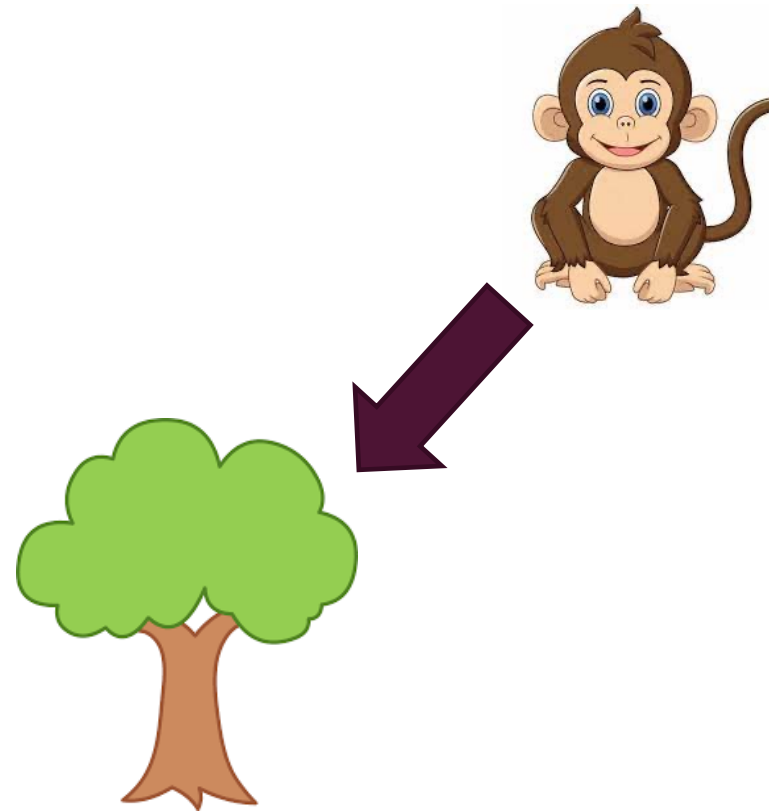


# LEVEL I – COORDINATION (ARBITRARY RELATION) TESTING BA

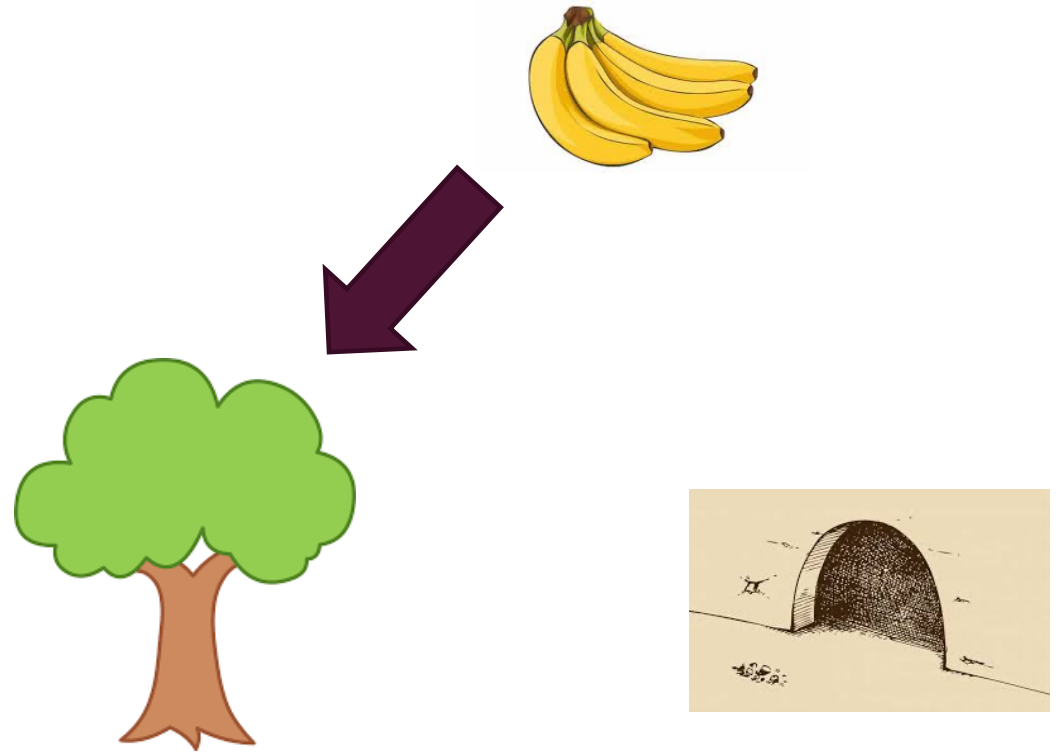




# LEVEL I – COORDINATION (ARBITRARY RELATION) TRAINING AC



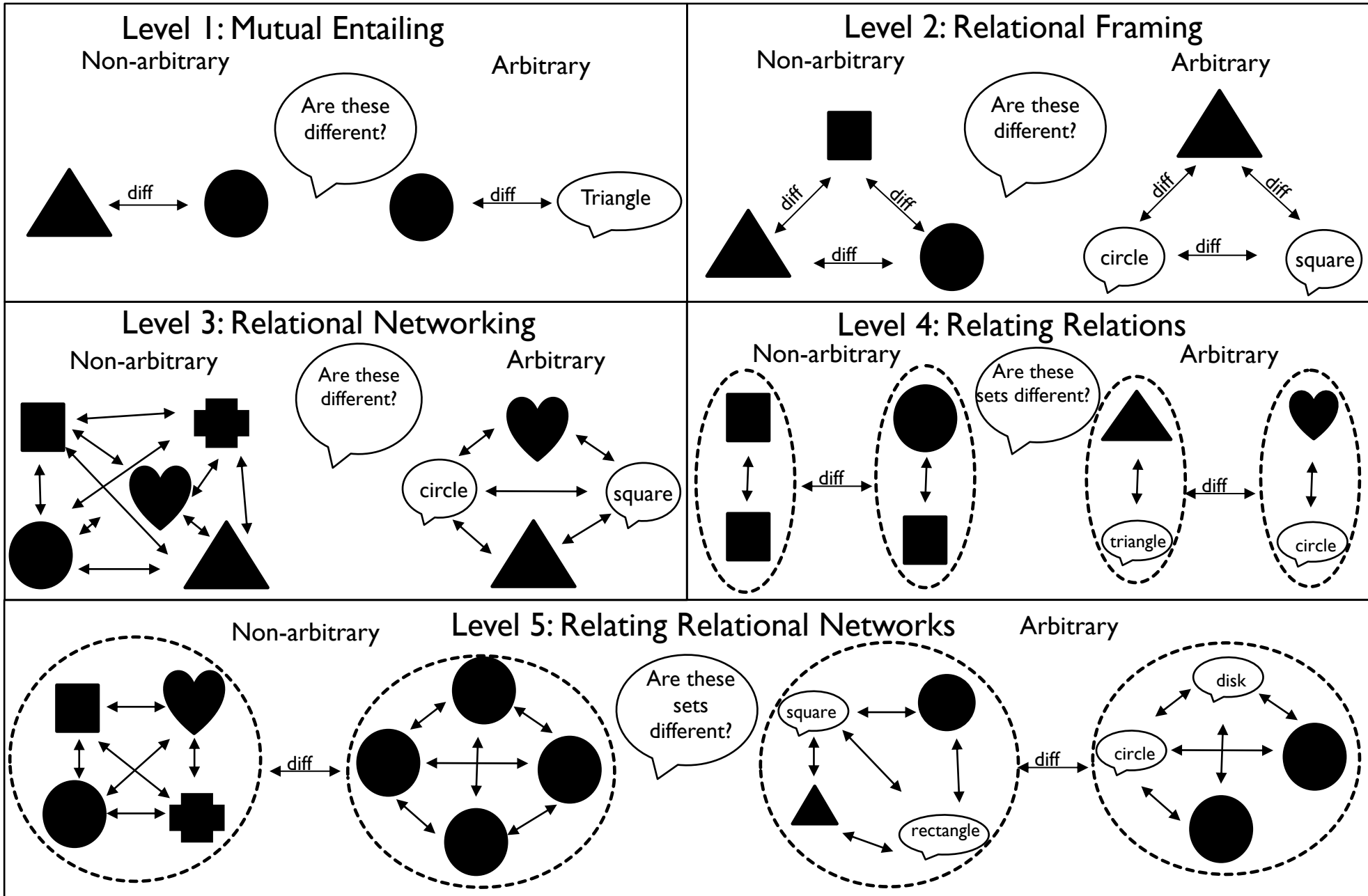
## LEVEL 2 – COORDINATION (ARBITRARY RELATIONS) TESTING BC





DIFFERENCE





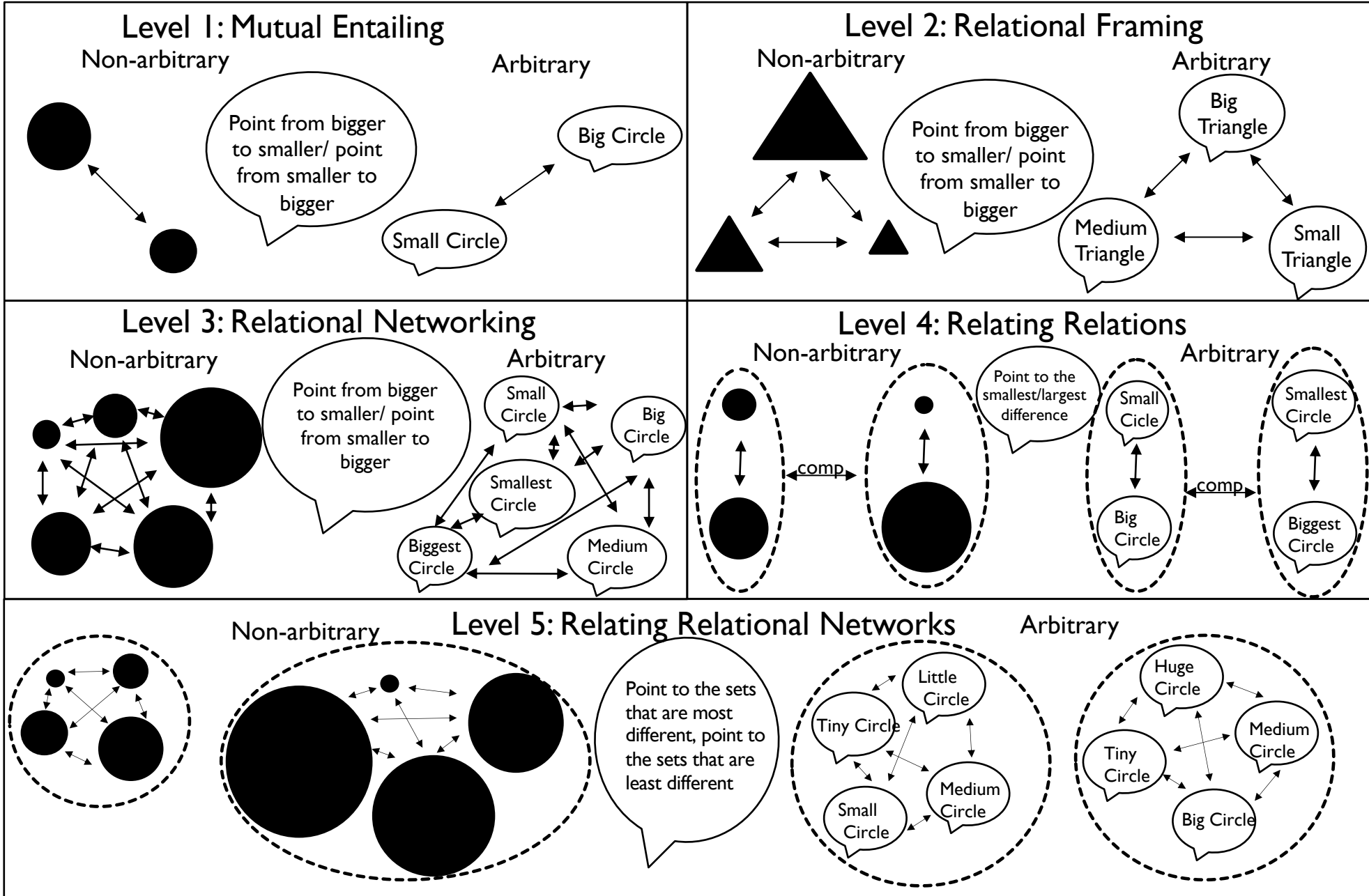
# LEVEL I – DIFFERENCE (ARBITRARY RELATIONS)





# COMPARISON





# LEVEL I – COMPARISON (NON ARBITRARY RELATIONS)

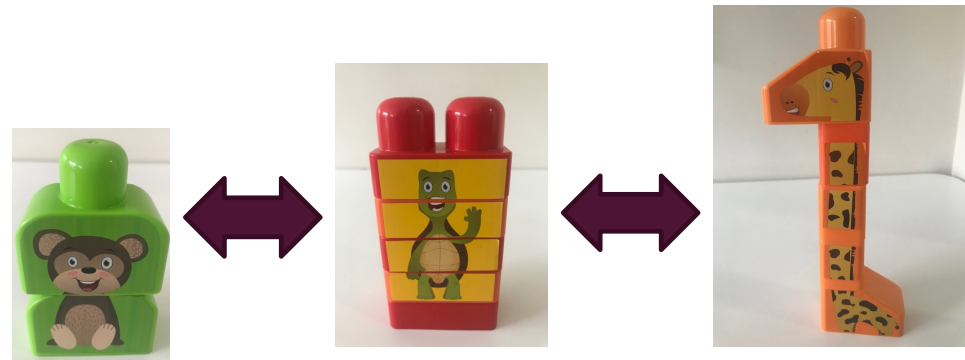




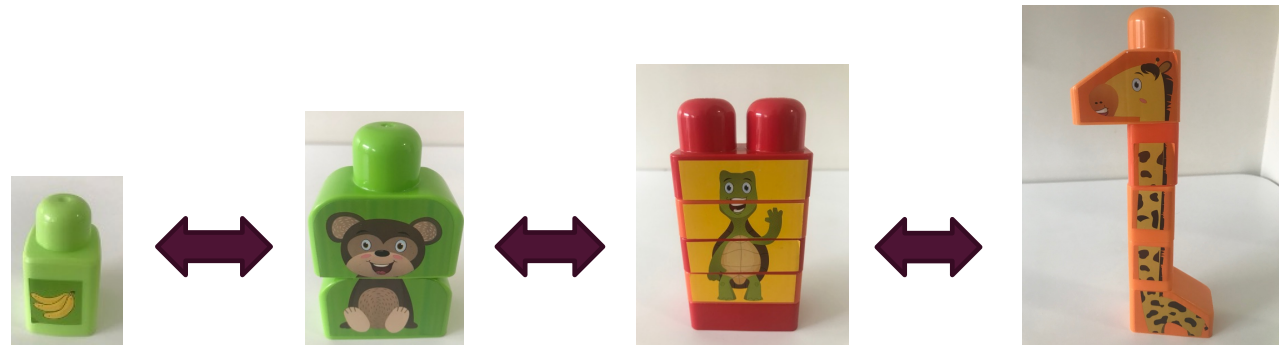
## LEVEL 2 – COMPARISON (NON ARBITRARY RELATIONS)



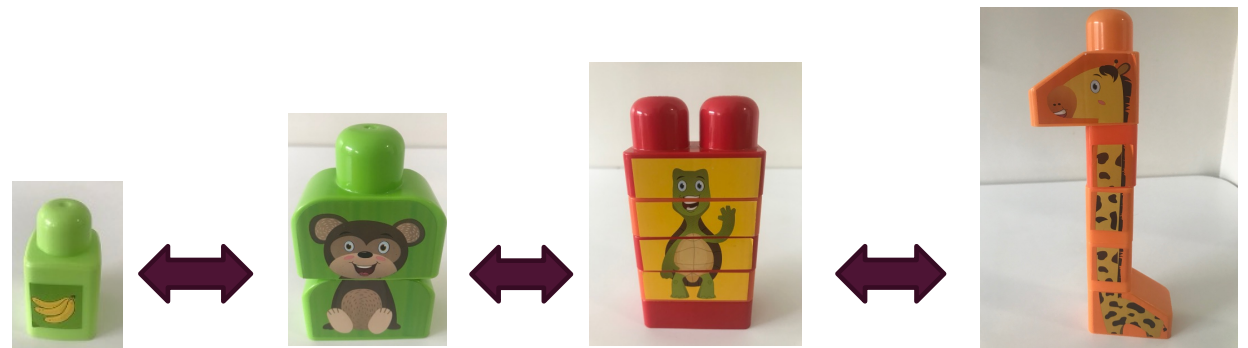
## LEVEL 2 – COMPARISON (NON ARBITRARY RELATIONS)



## LEVEL 3 – COMPARISON (NON ARBITRARY RELATIONS)



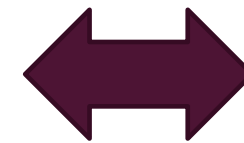
## LEVEL 3 – COMPARISON (NON ARBITRARY RELATIONS)



# LEVEL 4 – COMPARISON (NON ARBITRARY RELATIONS)



SET 1



SET 2

## Q & A

- To what extent what we show here is similar or different from what you do?



# EMPOLYING MDML FOR RELATIONAL REPERTOIRE EVALUATION



# BACKGROUND

- Relational repertoire: is there a pattern?  
Lipkens, Hayes & Hayes (1993).
- Frames interactions and experiences that enable responding under certain specific contextual controls.
- Focus will always be experience, but we can infer the opportunities observing the participant's ages.



# COORDINATION, DIFFERENCE AND COMPARISON 4-6 YEARS.

- Barnes-Holmes, Barnes-Holmes, Smeets, Strand et al., (2004)
- Berens, & Hayes, 2007
- Hayes, Stewart, & McElwee, 2016
- Barnes-Holmes, Barnes-Holmes & Smeets (2004)

# OPPOSITION, HIERARCHY, TEMPORAL AND SPATIAL 6-8 YEARS

- Mulhern, Stewart, and McElwee (2018)
  - Mulhern et al. (2017)
  - Carpentier et al. (2002)
  - Bim, de Almeida, Silveira & Haydu (in preparation).
- 
- General: Kisten and Stewart (2021)
  - Coordination, Comparison, Opposition, Temporality and Hierarchy.

# THE MDML FRAMEWORK

Dimensions

	Coherence	Diversity	Complexity	Deviation	Flexibility
1	Basic Stage	Basic Stage	Intermediate Stage	Intermediate Stage	Intermediate Stage
2	Basic Stage	Basic Stage	Intermediate Stage	Intermediate Stage	Intermediate Stage
3	Intermediate Stage	Intermediate Stage	Intermediate Stage	Advanced Stage	Advanced Stage
4	Advanced Stage	Advanced Stage	Advanced Stage	Advanced Stage	Advanced Stage
5	Advanced Stage	Advanced Stage	Advanced Stage	Advanced Stage	Advanced Stage

Basic Stage

Intermediate Stage

Advanced Stage

## USING DIMENSIONS EXPLICITLY ON THE TRIALS

Low Flexibility	<p>Structure of stimuli array: Fixed Contextual cues: one</p>	<p>Number of distractors: minimal Nature of the stimuli: visual only Type of response: Receptive only</p>	Low Complexity
High Flexibility	<p>Structure of stimuli array: Varied Contextual cues: Multiple</p>	<p>Number of distractors: Increasing Nature of the stimuli: visual/auditory Type of response: Receptive/Expressive</p>	High Complexity



Low Flexibility  
+ Low  
Complexity

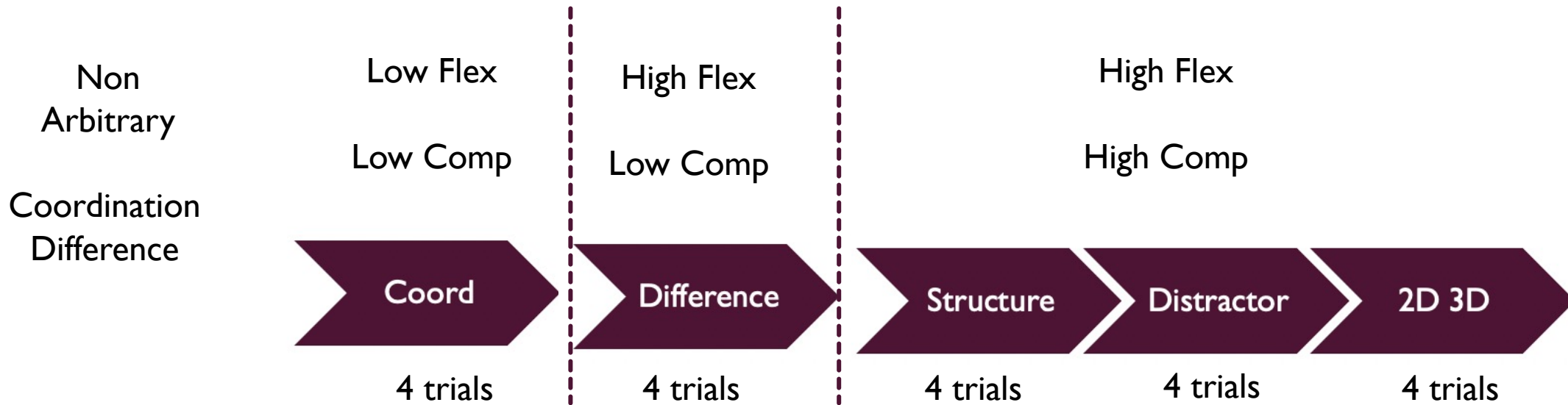


High Flexibility  
+ Low  
Complexity



High Flexibility  
+ High  
Complexity

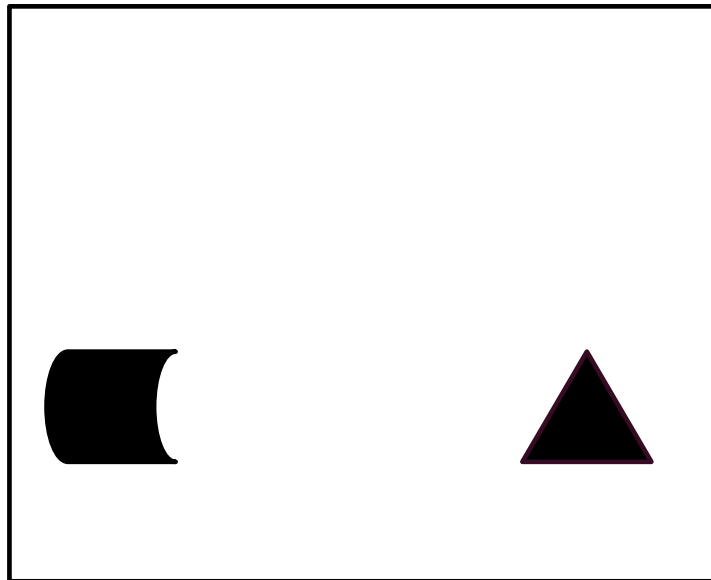
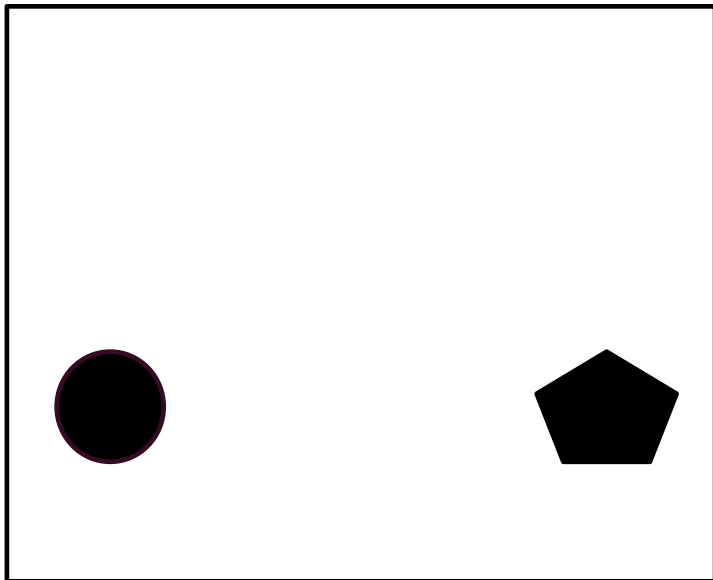
# INCREASING COMPLEXITY AND FLEXIBILITY COORDINATION AND DIFFERENCE LEVEL I



Coordination



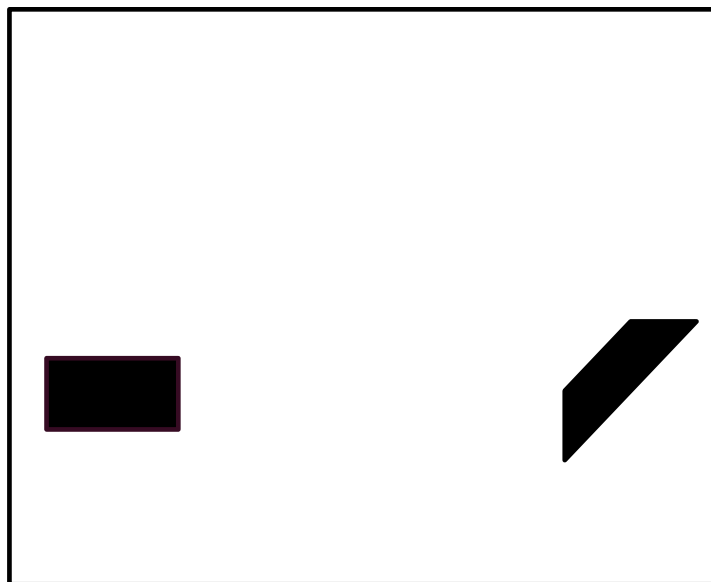
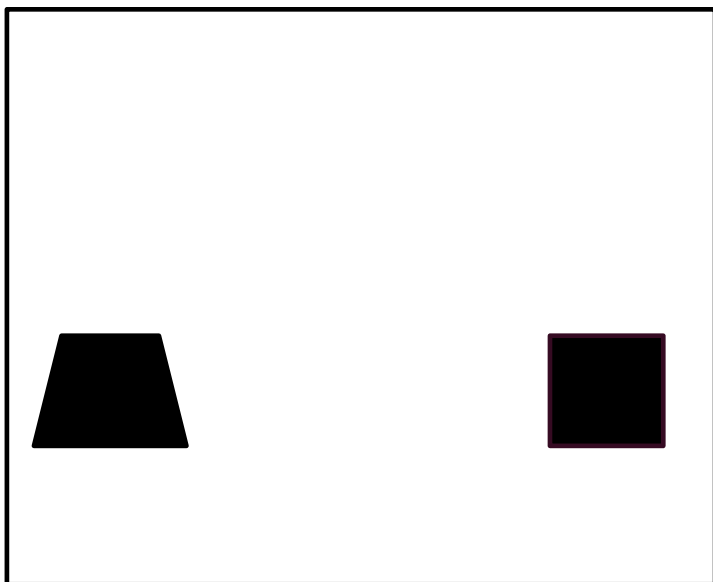
sample



sample



sample

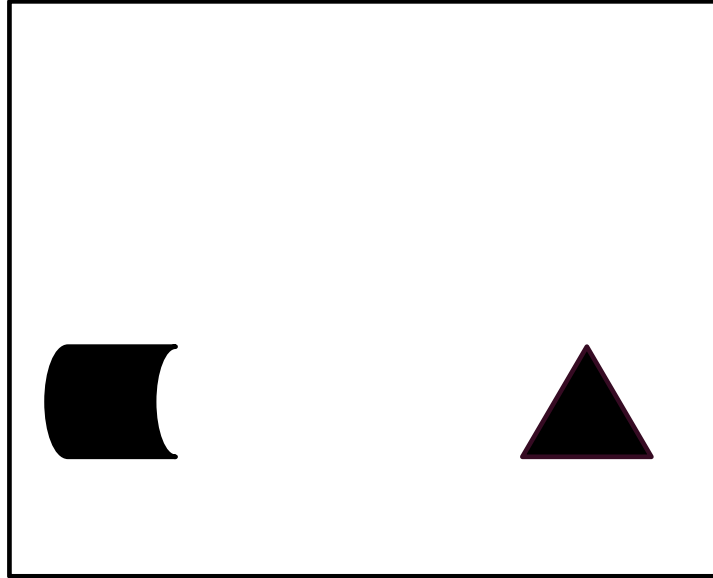
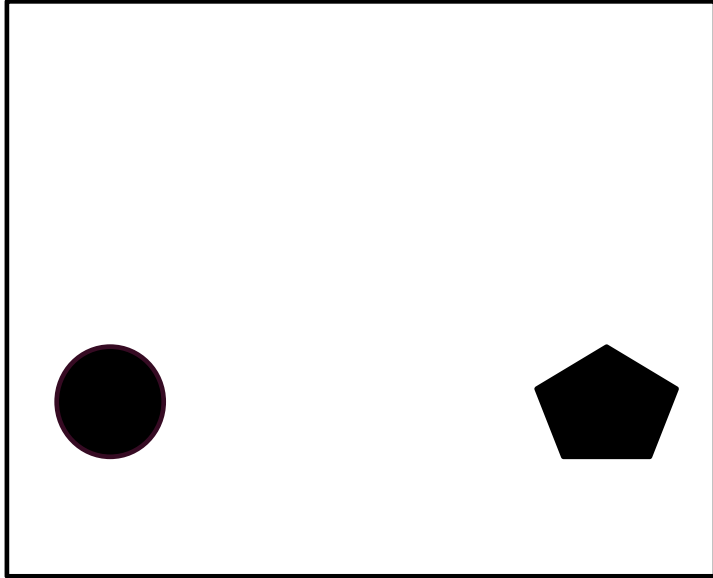


sample

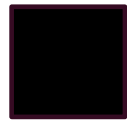
Difference



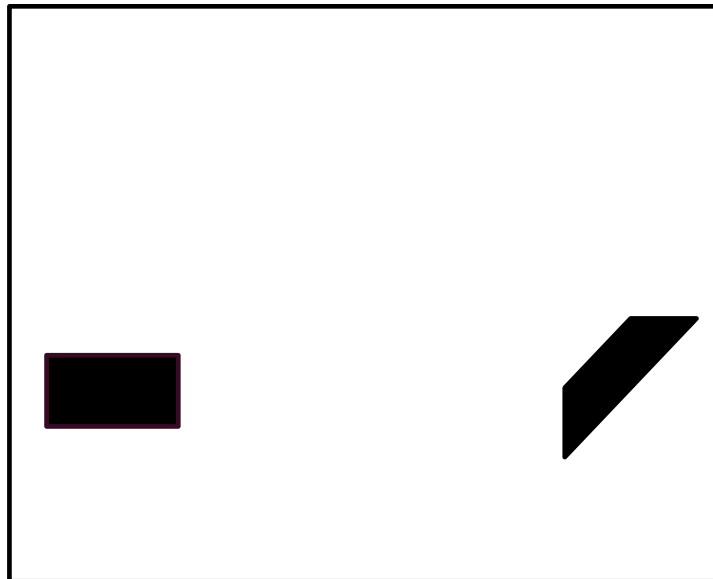
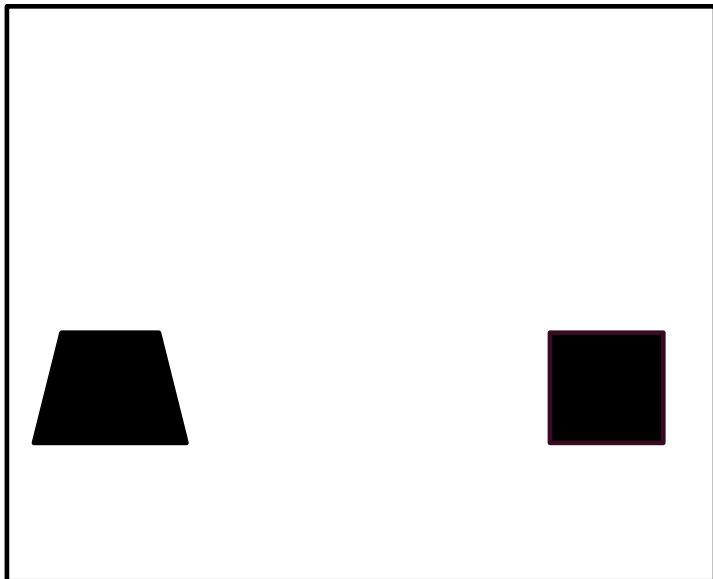
sample



sample



sample



sample

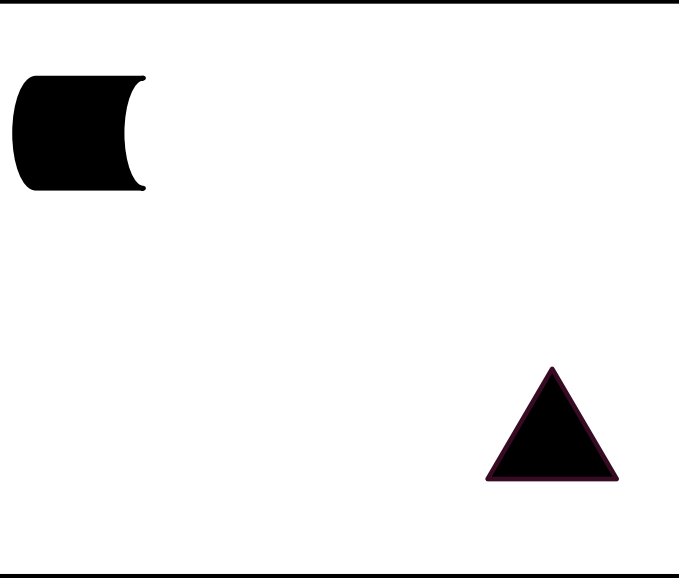
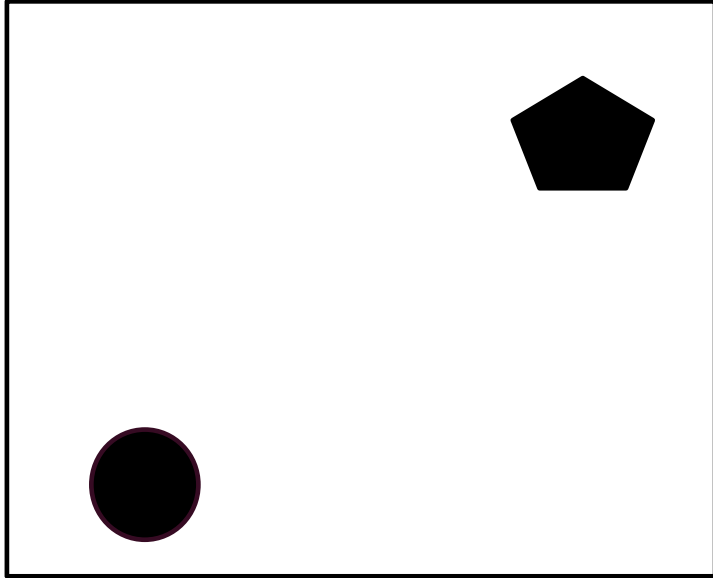




Coordination

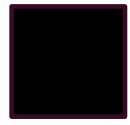


sample

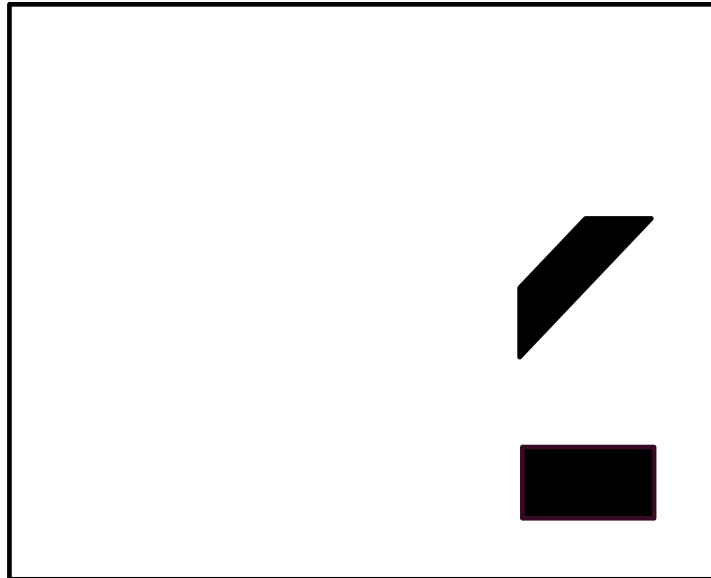
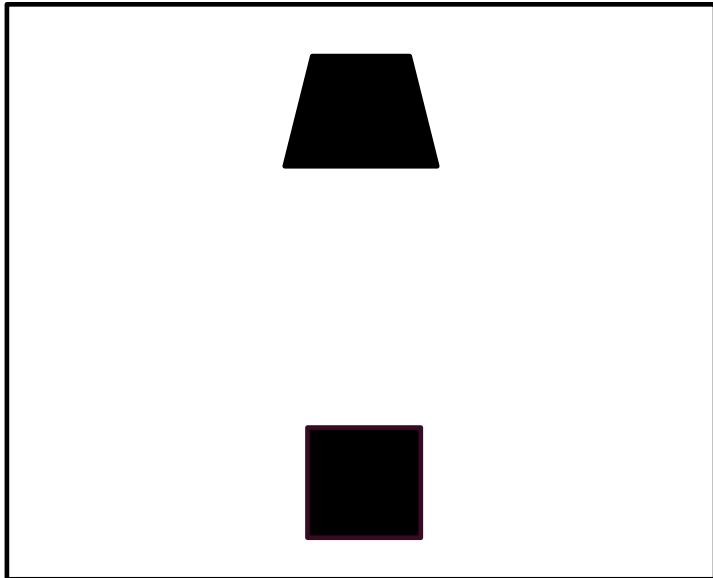


sample

Difference



sample



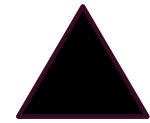
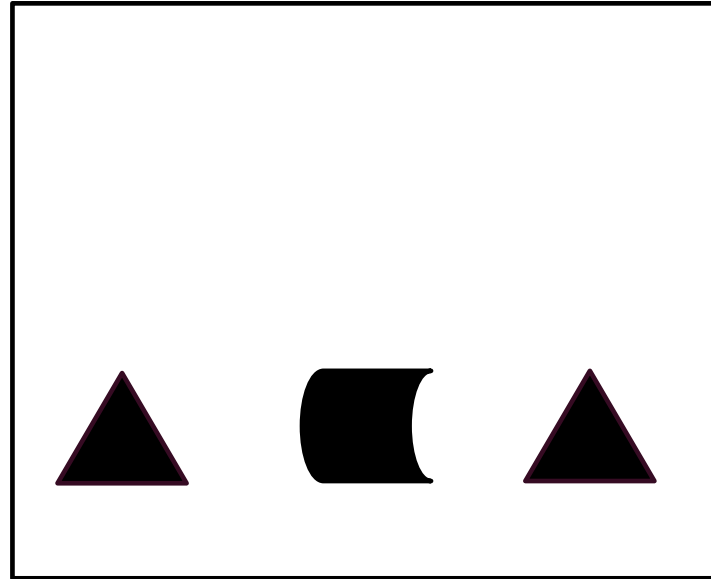
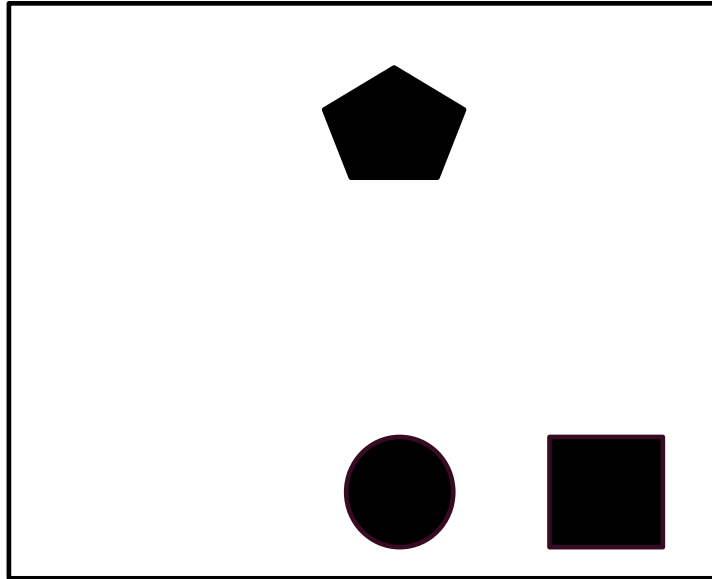
sample

Coordination

Difference



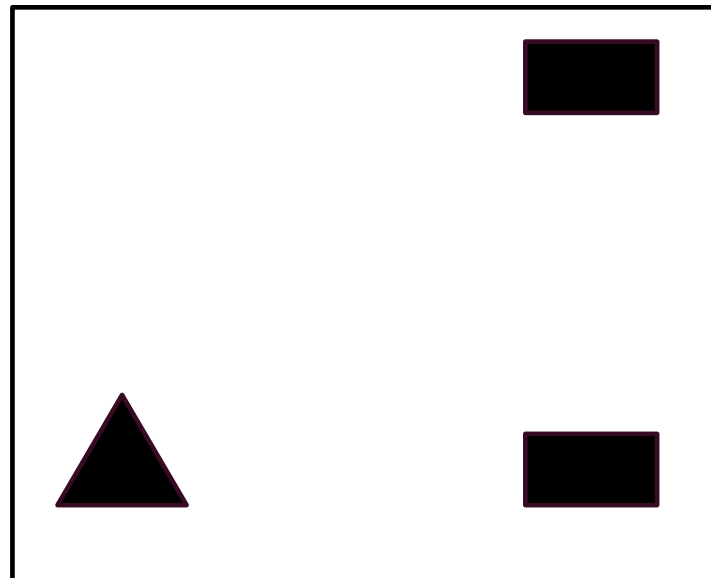
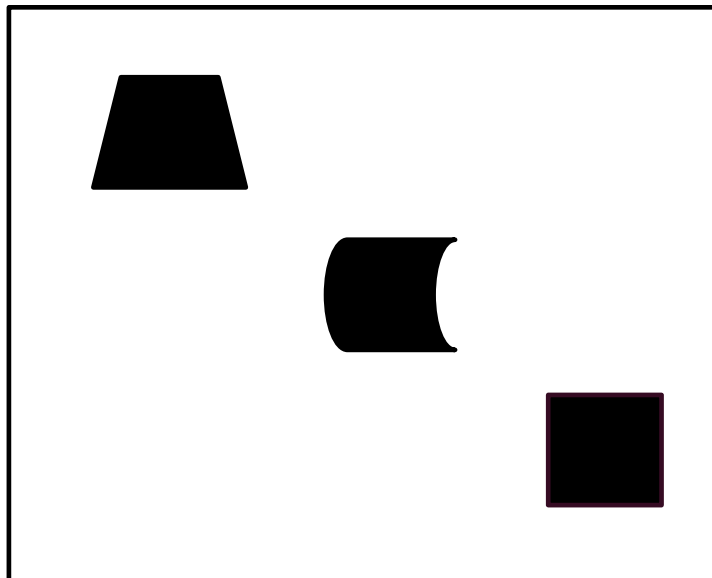
sample



sample

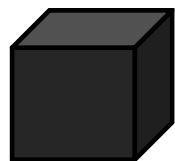


sample

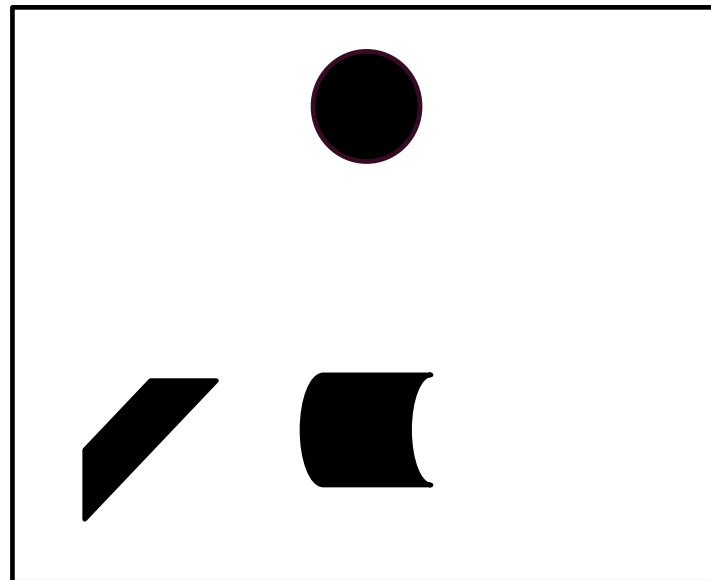


sample

Coordination



sample

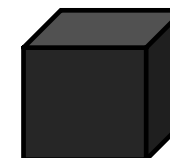
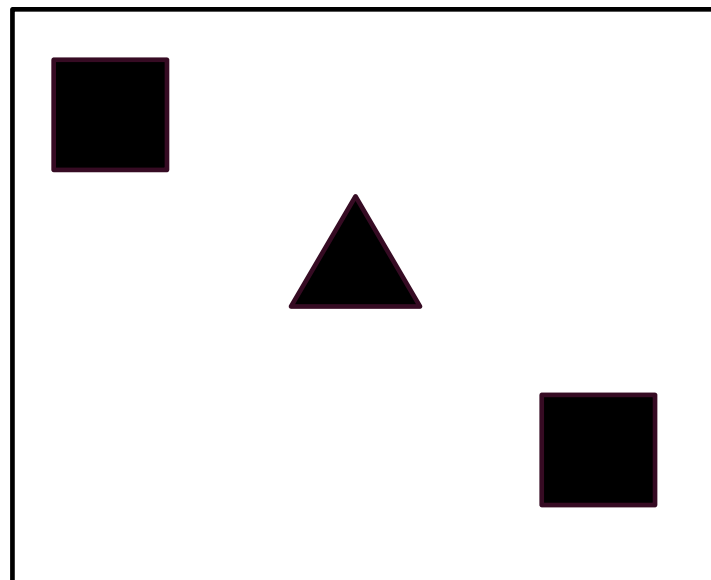
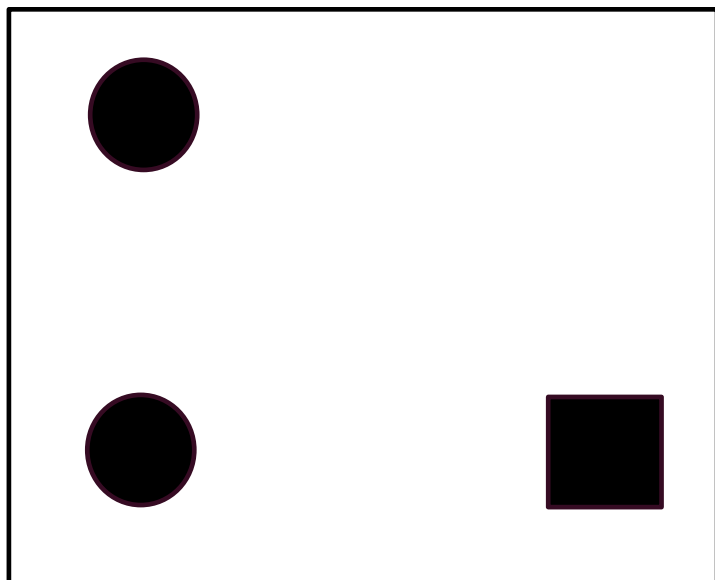


sample

Difference

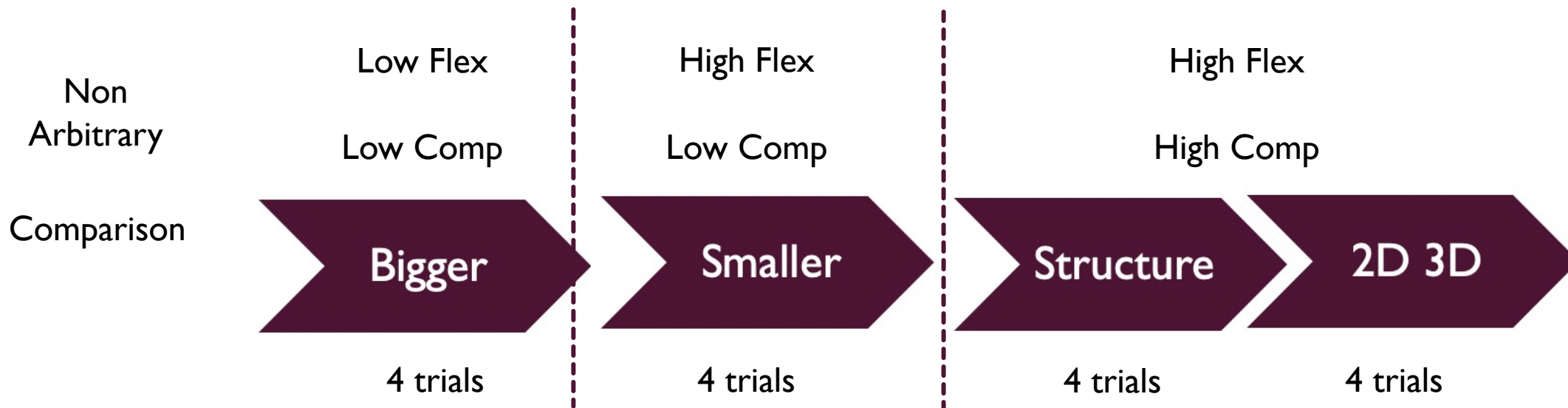


sample

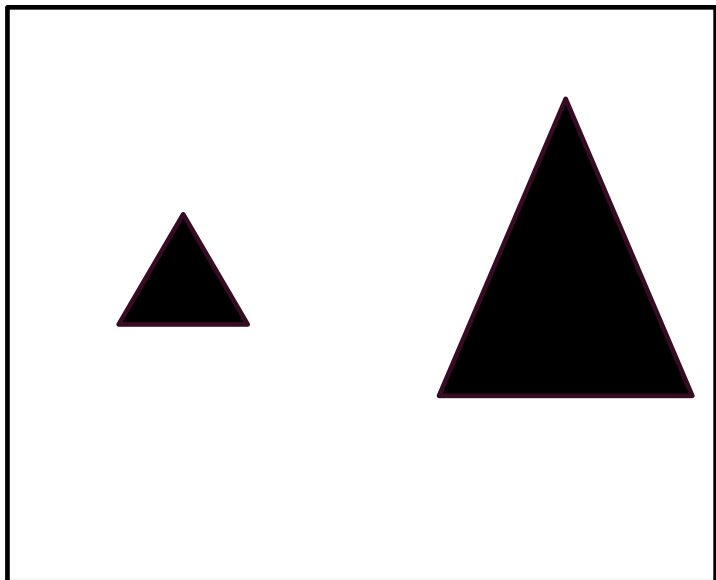
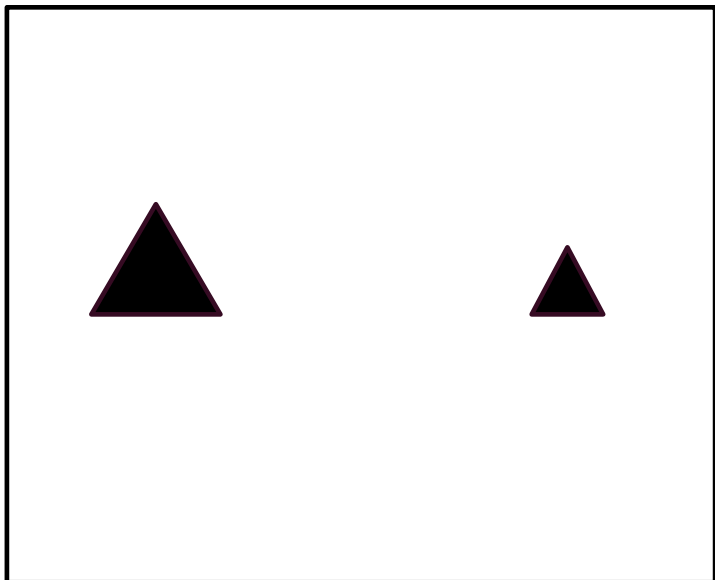
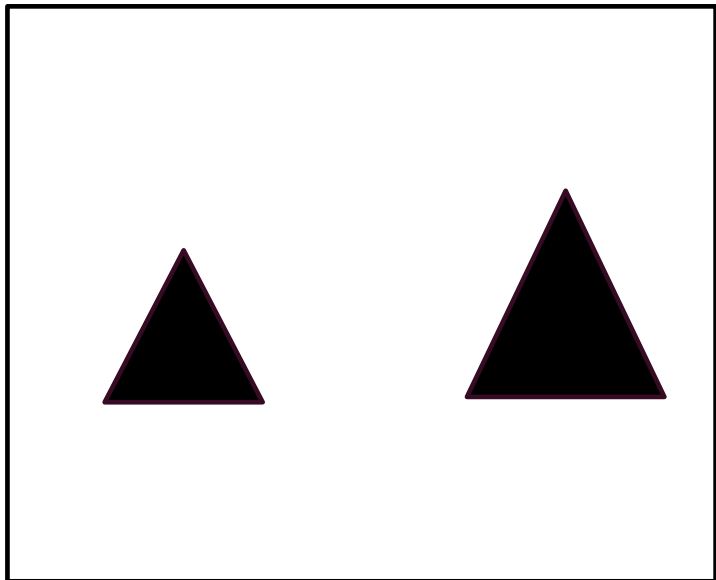
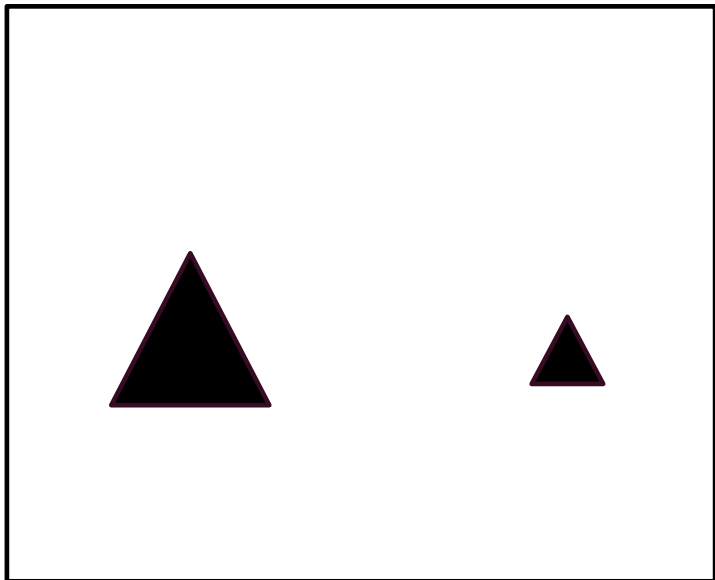


sample

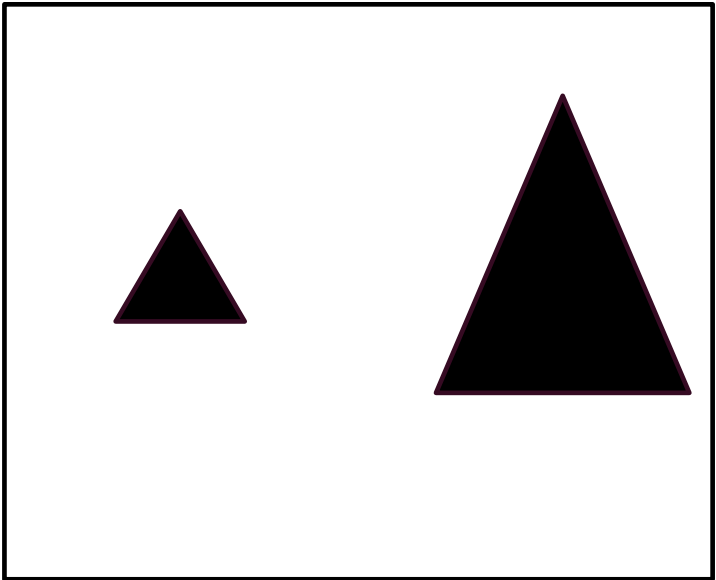
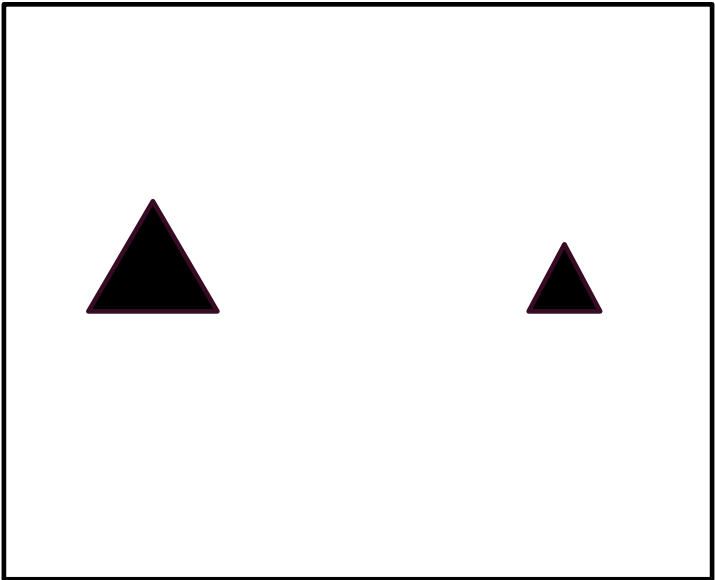
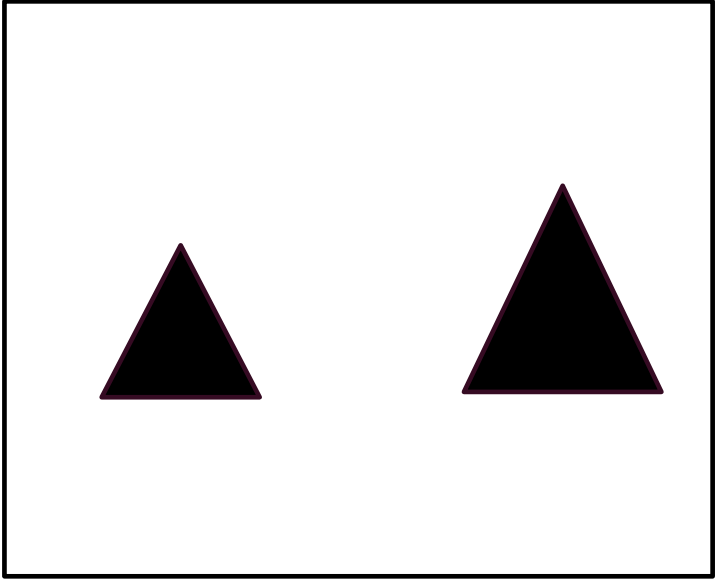
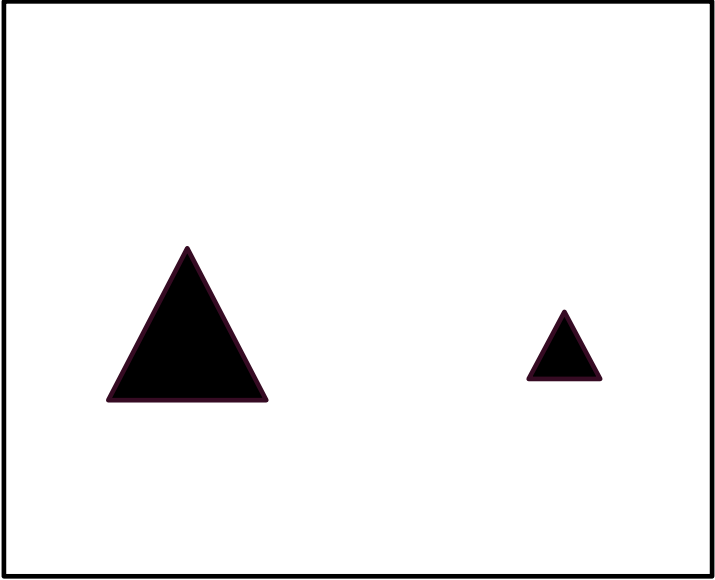
# INCREASING COMPLEXITY AND FLEXIBILITY COMPARISON LEVEL I



Biggest

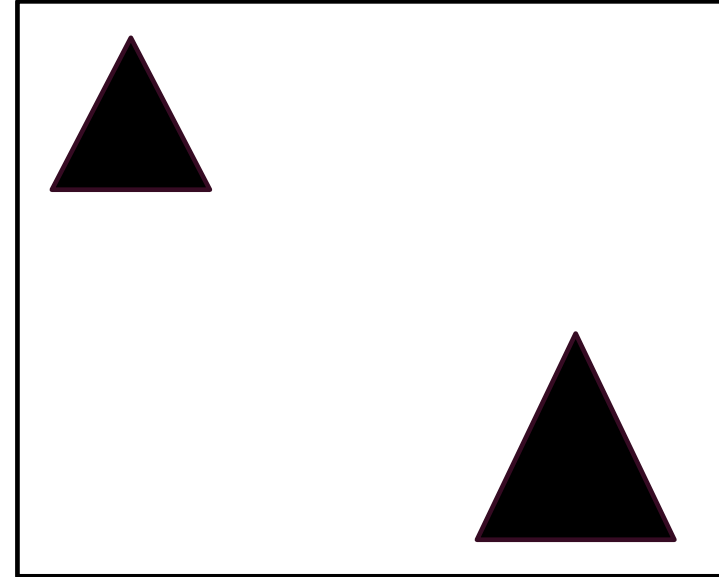
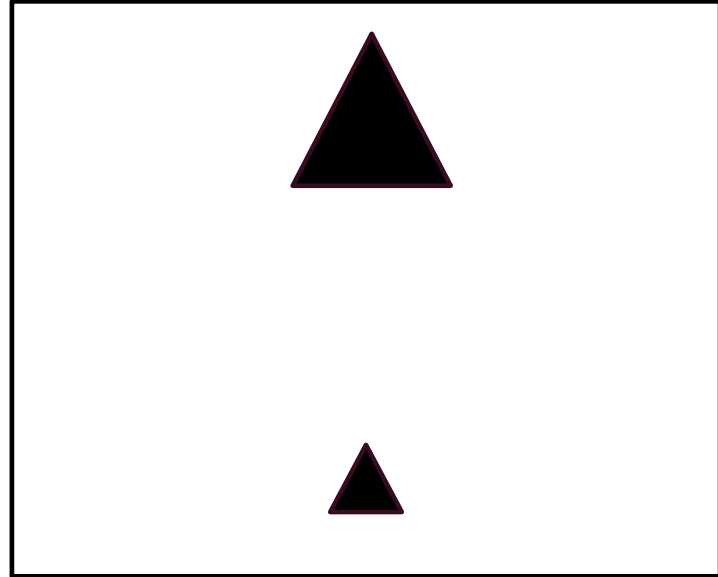


Smallest

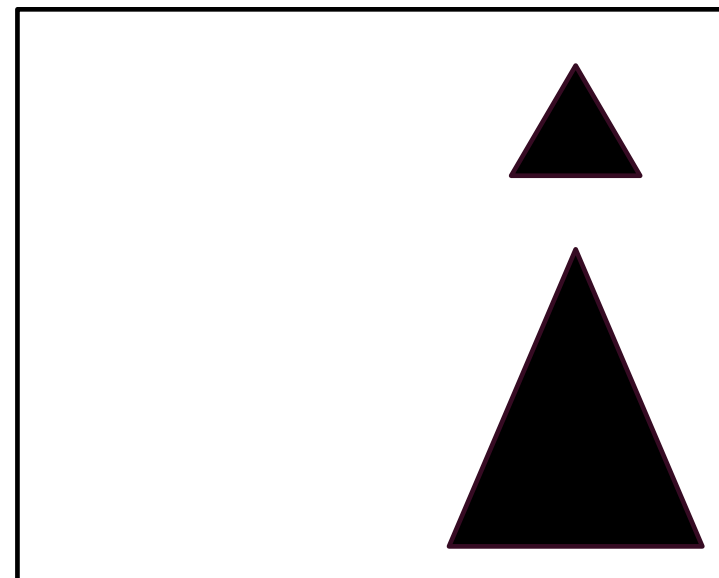
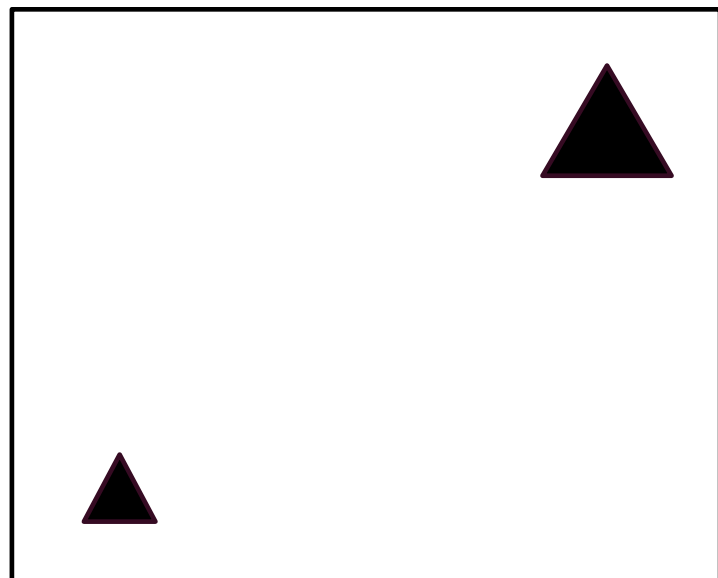




Smallest

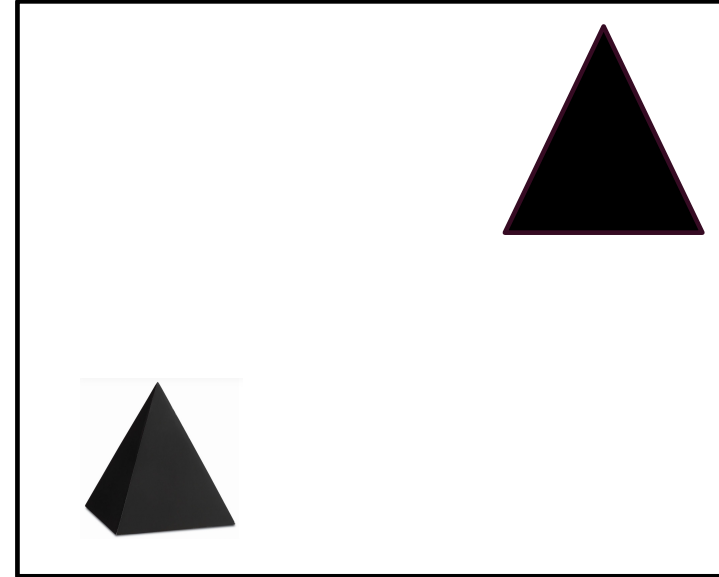
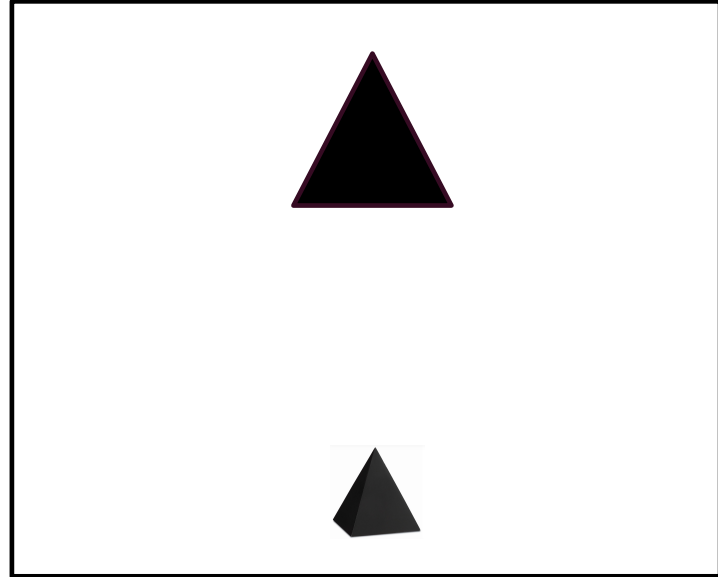


Biggest

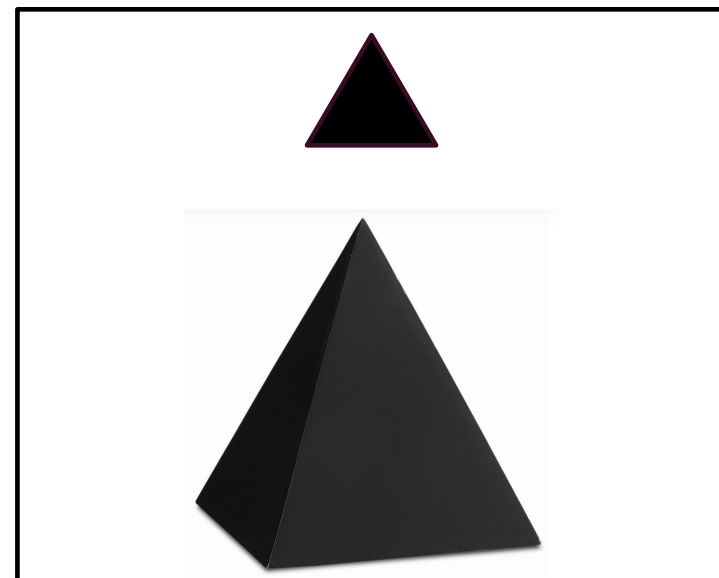
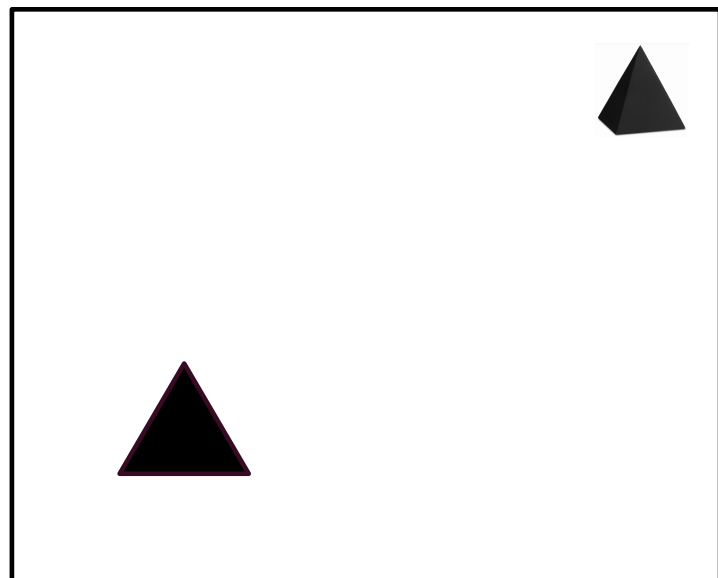




Smallest

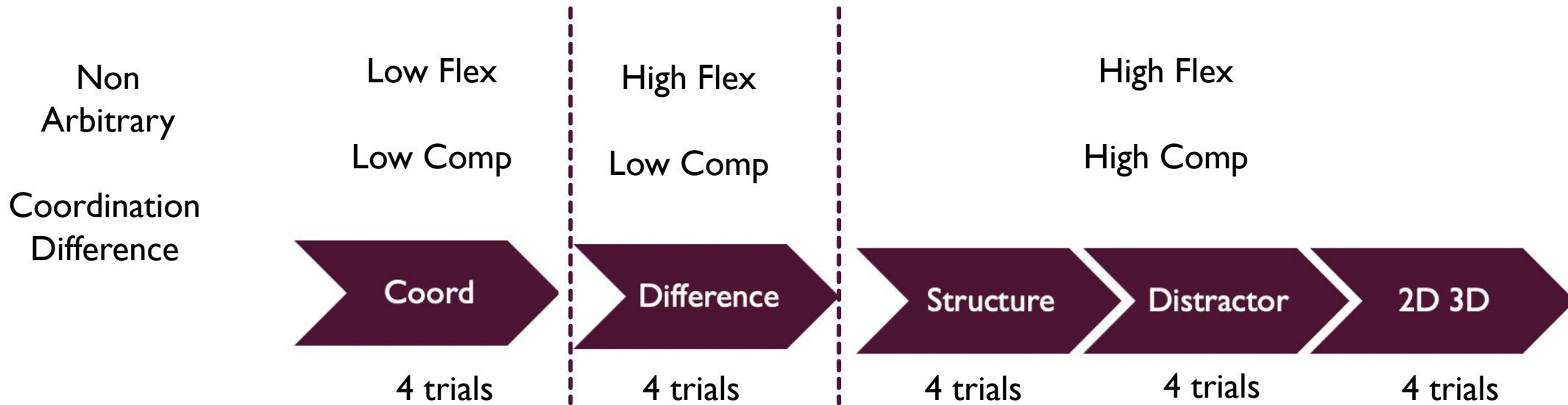


Biggest





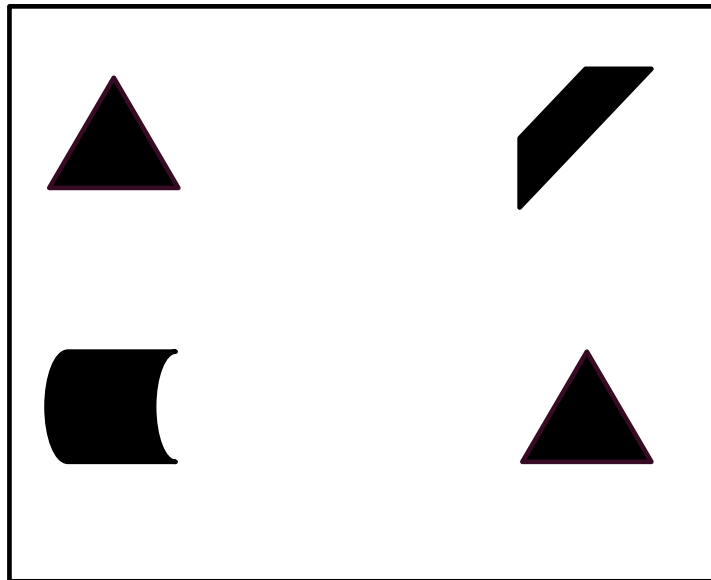
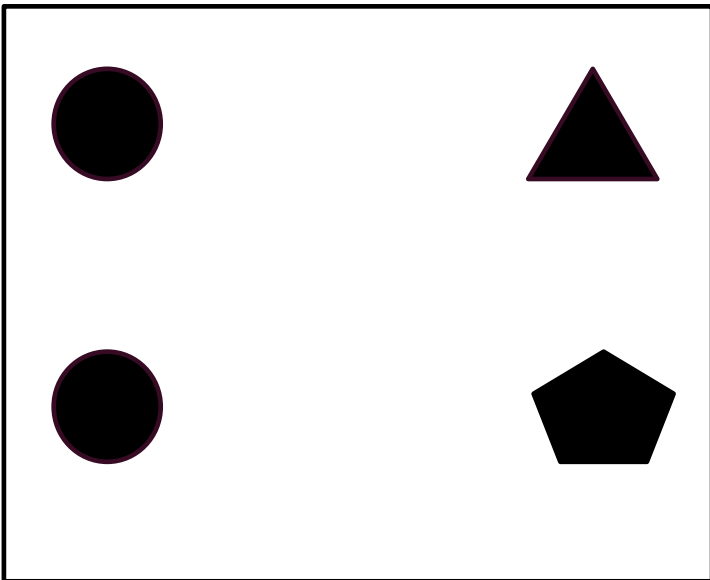
# INCREASING COMPLEXITY AND FLEXIBILITY COORDINATION AND DIFFERENCE LEVEL 2



Coordination



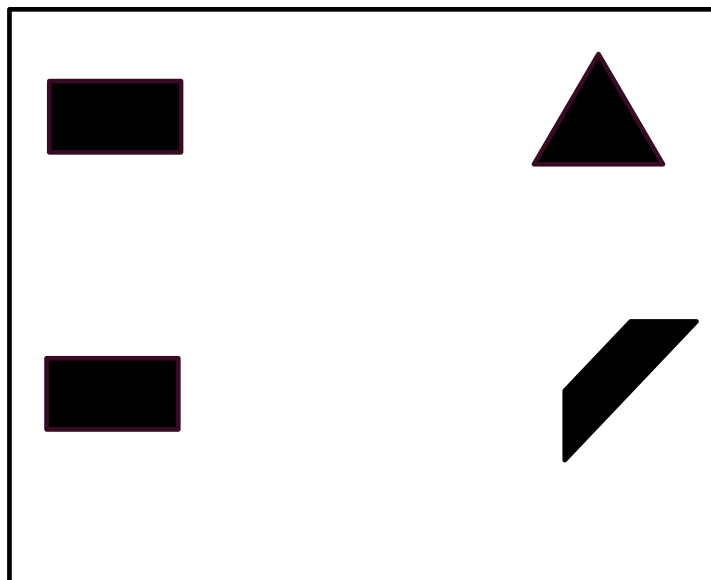
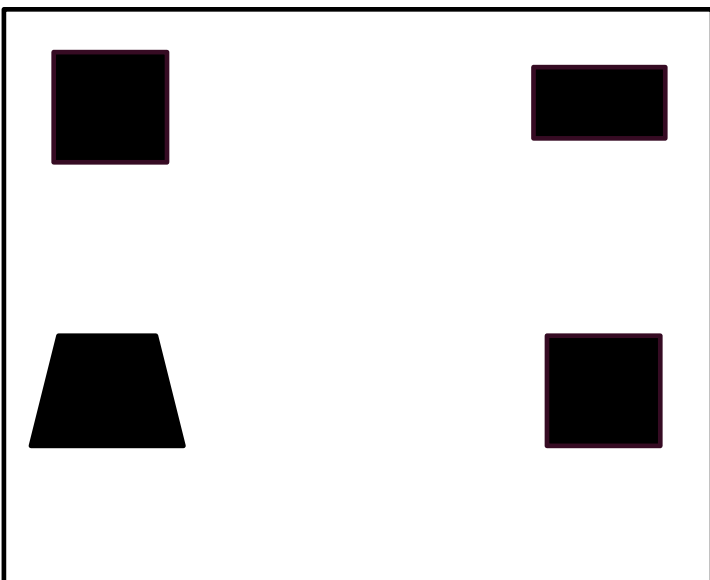
sample



sample



sample

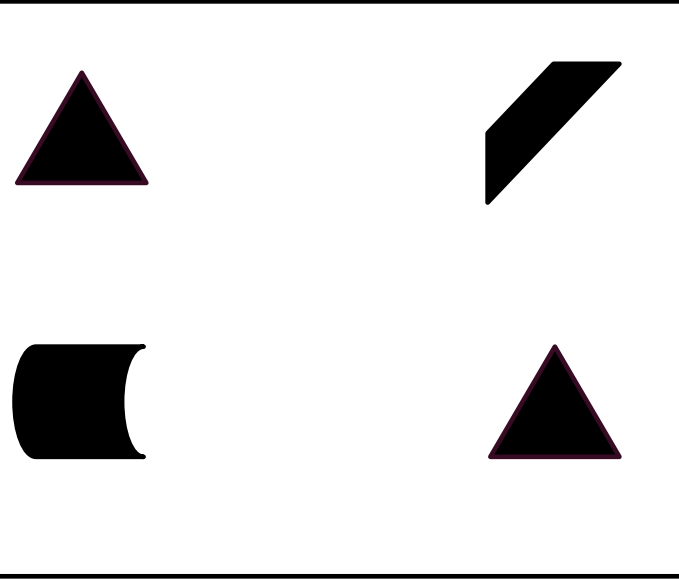
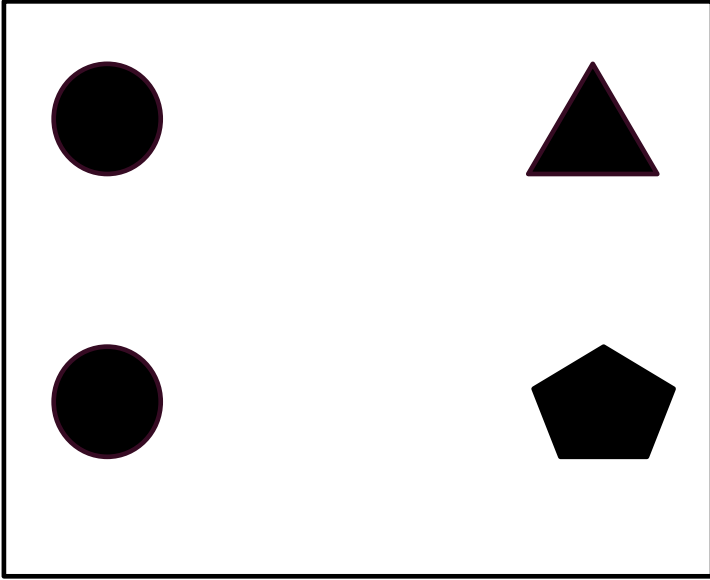


sample

Difference



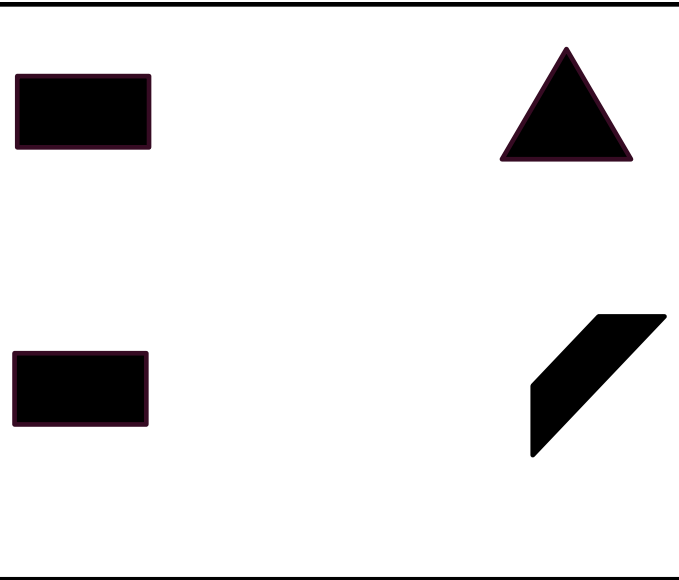
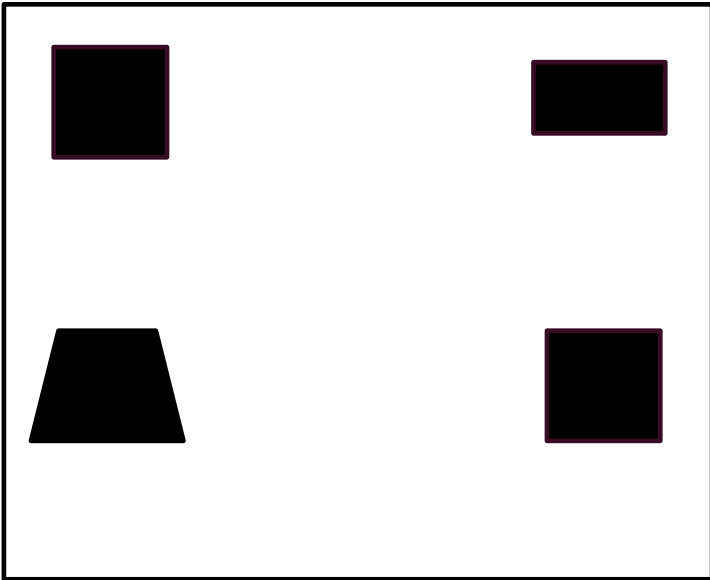
sample



sample



sample

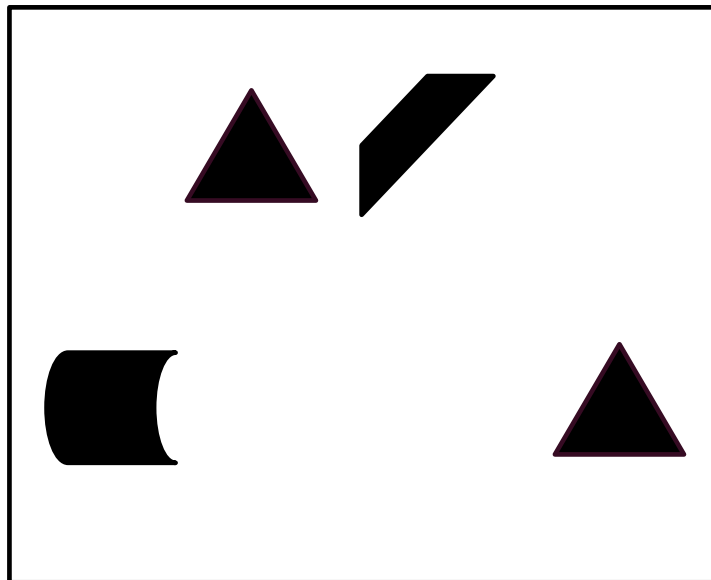
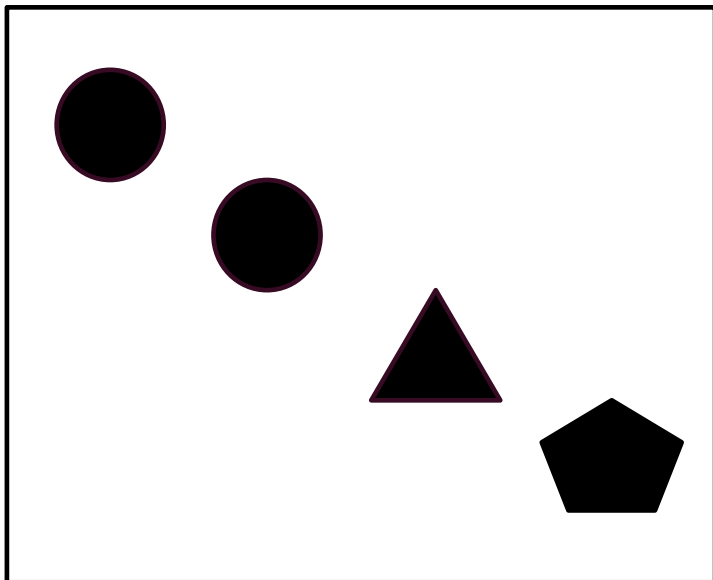


sample

Coordination

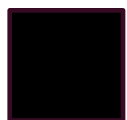


sample

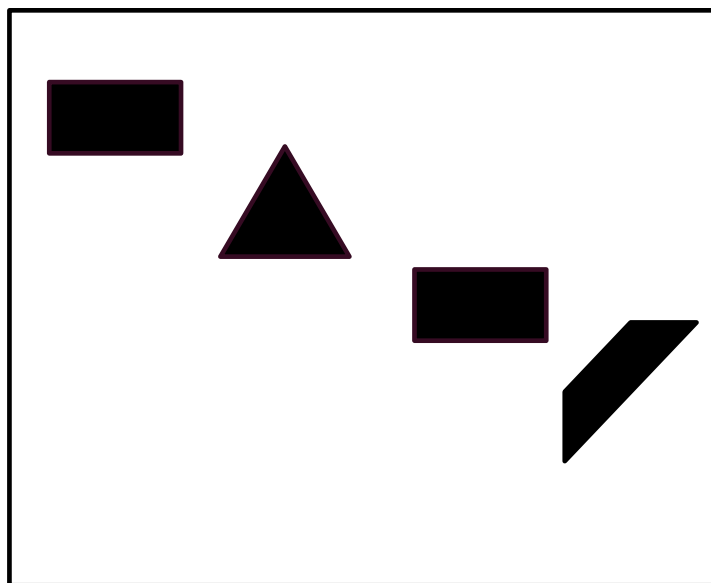
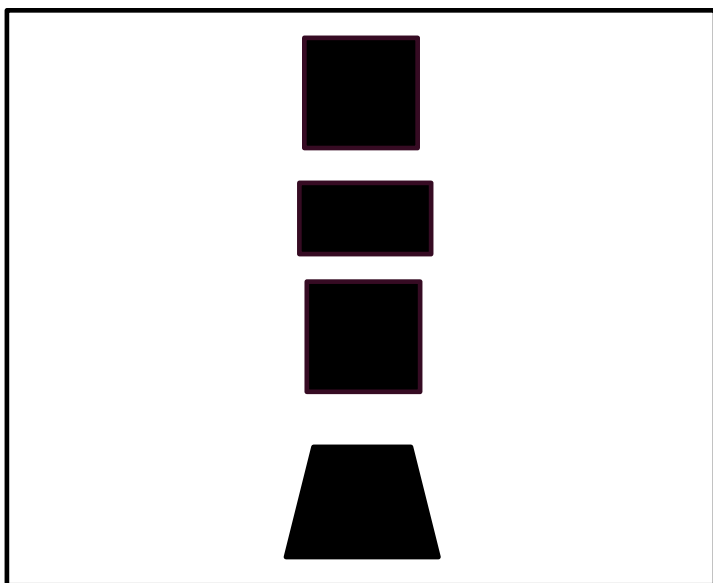


sample

Difference



sample

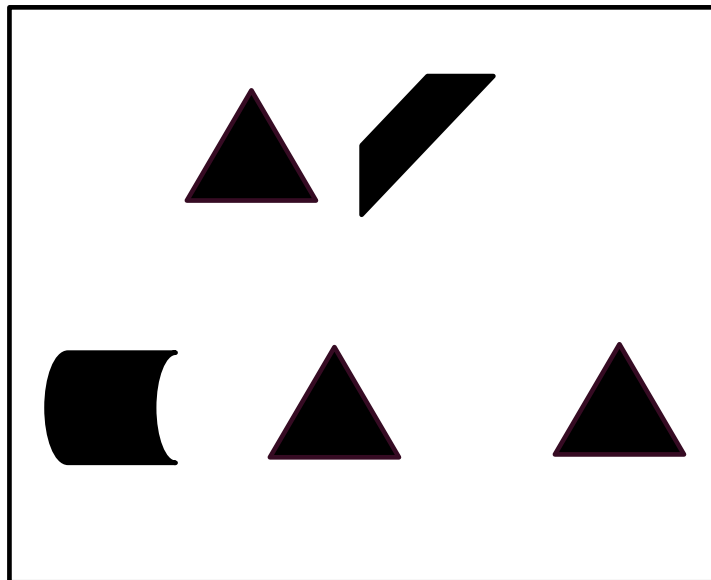
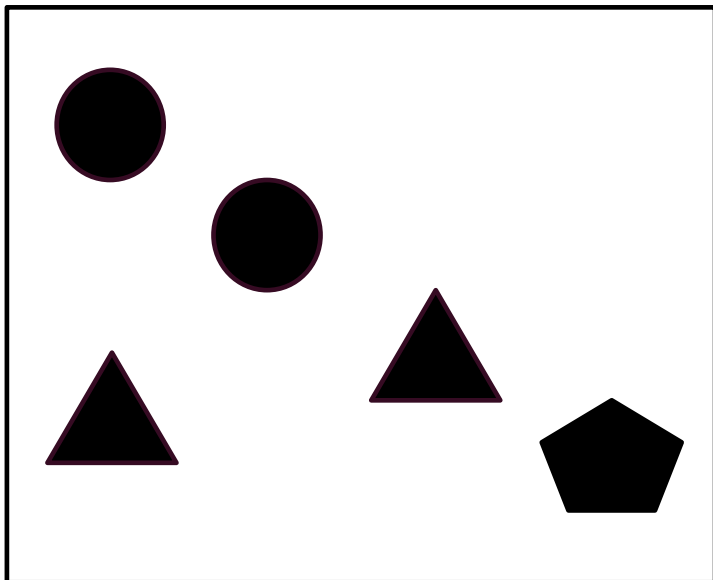


sample

Coordination

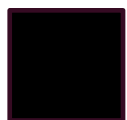


sample

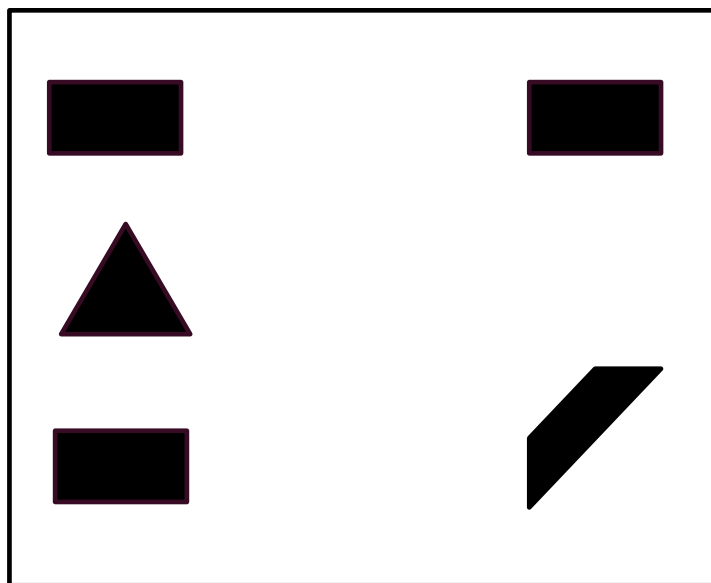
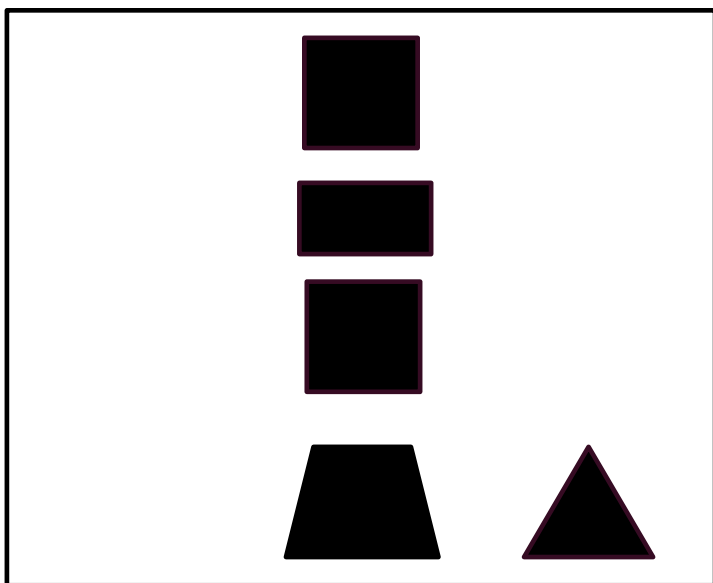


sample

Difference

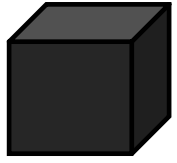


sample

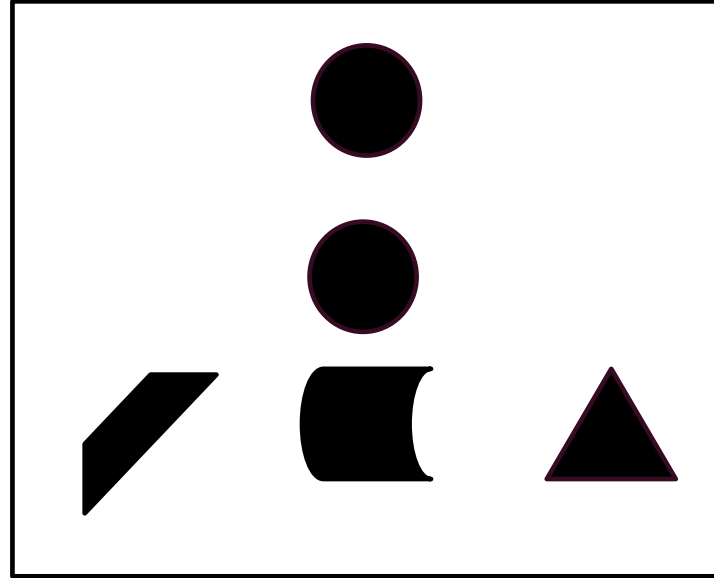
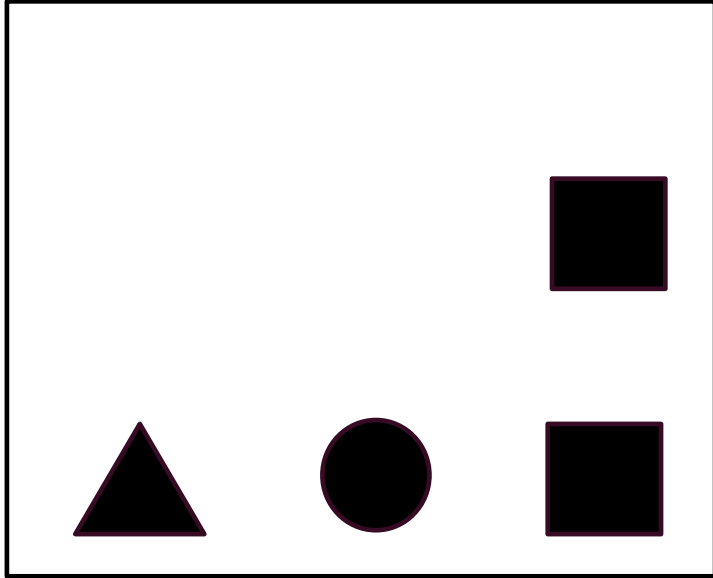


sample

Coordination



sample

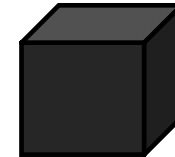
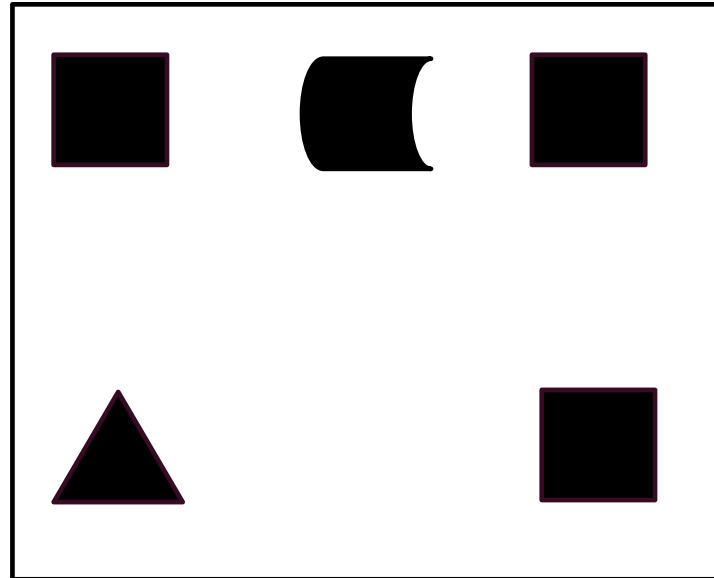
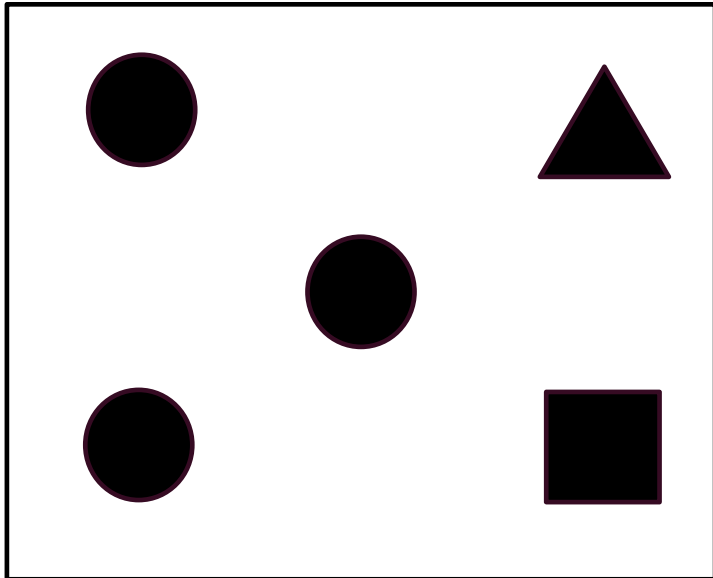


sample

Difference

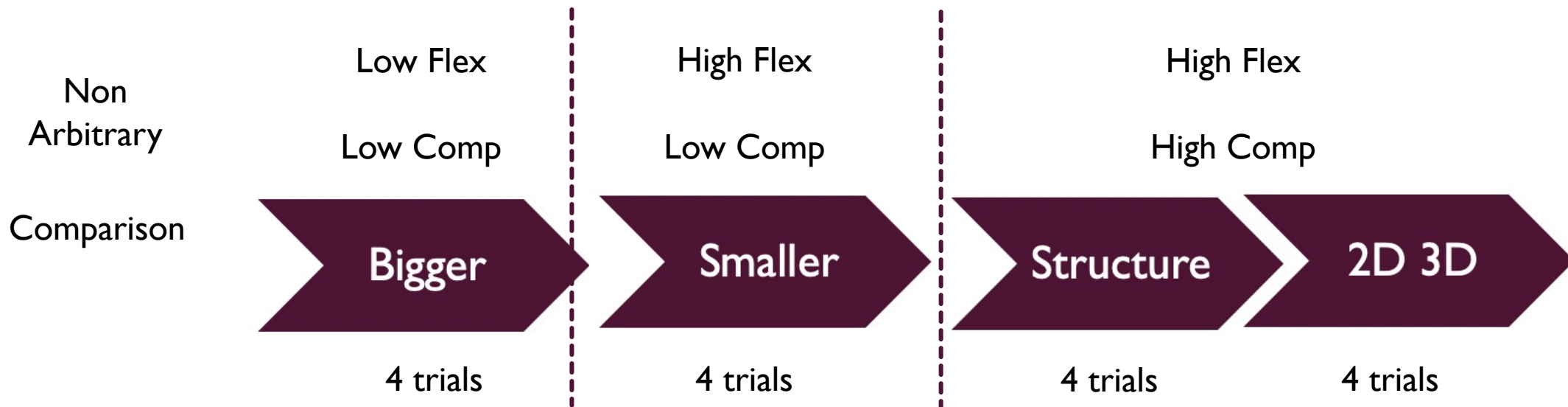


sample

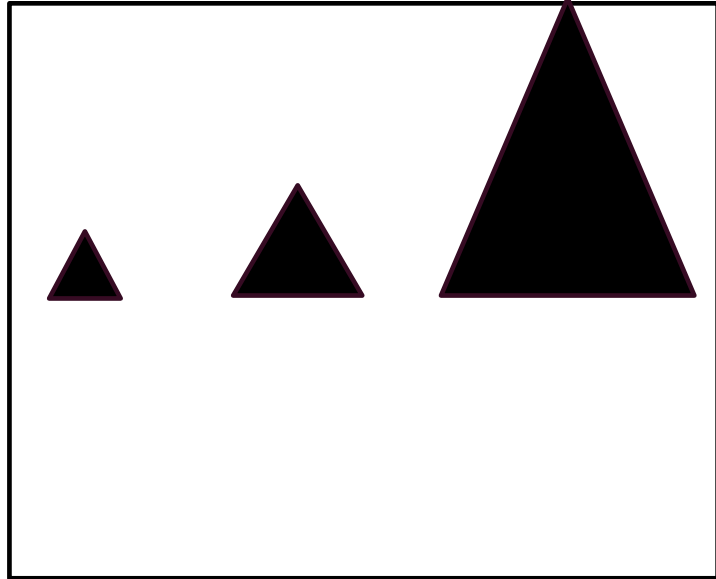
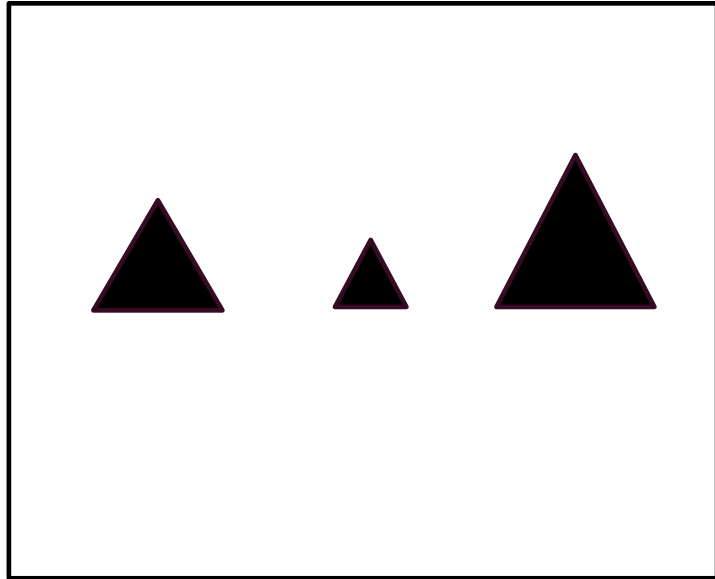
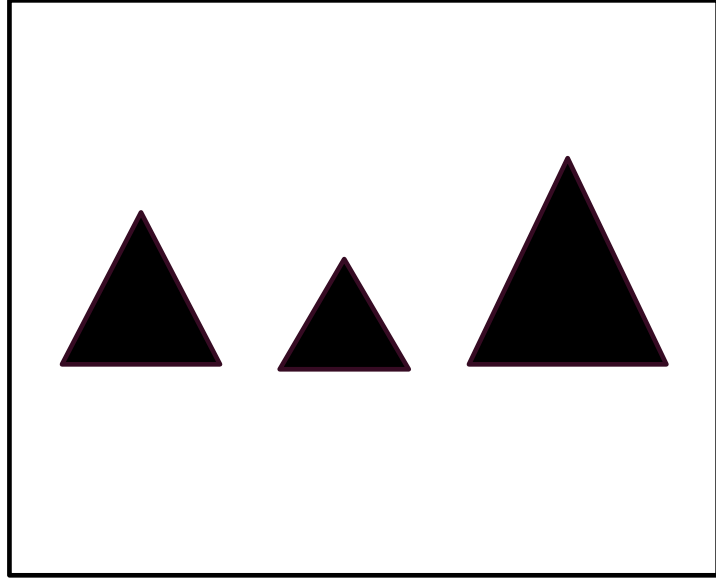
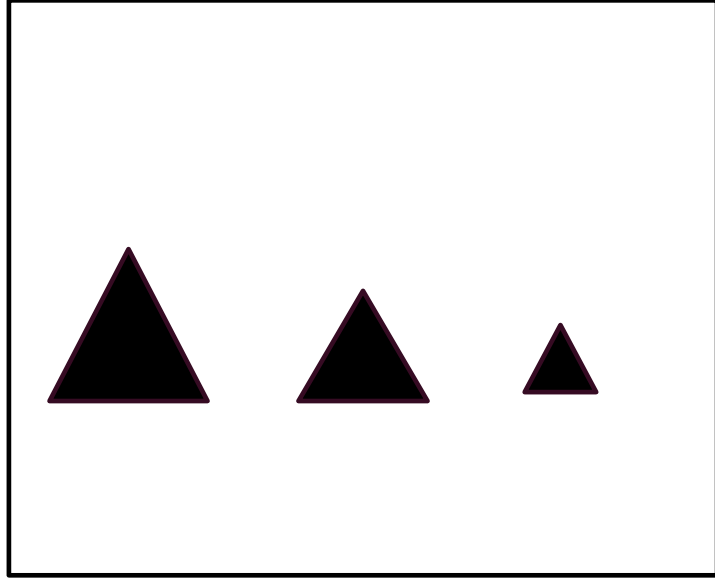


sample

# INCREASING COMPLEXITY AND FLEXIBILITY COMPARISON LEVEL 2

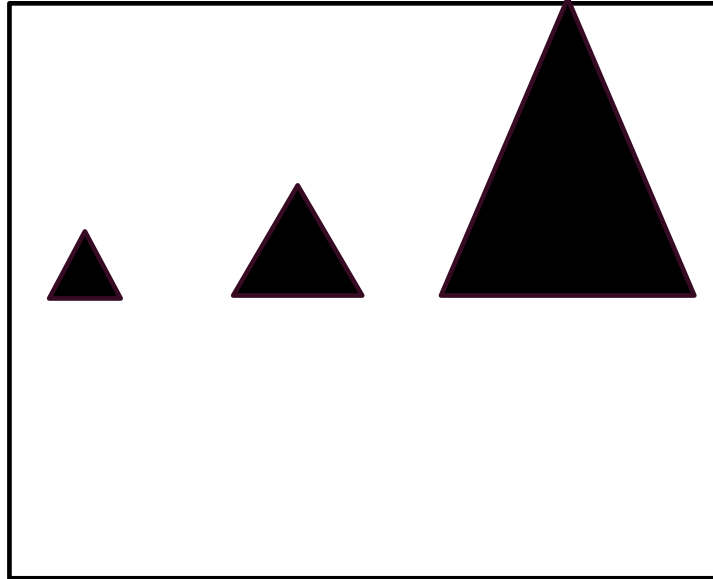
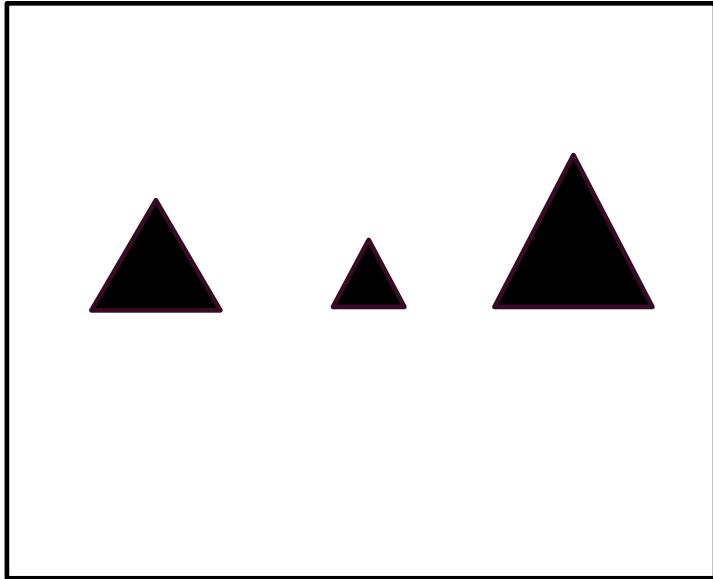
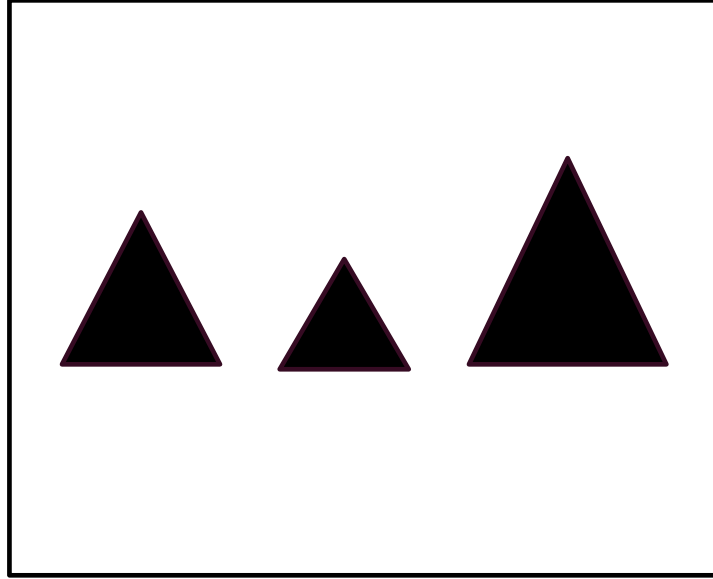
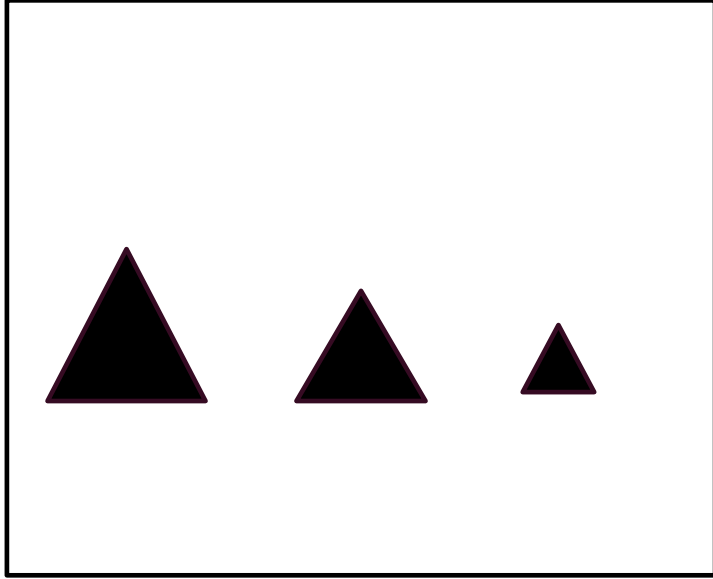


Biggest



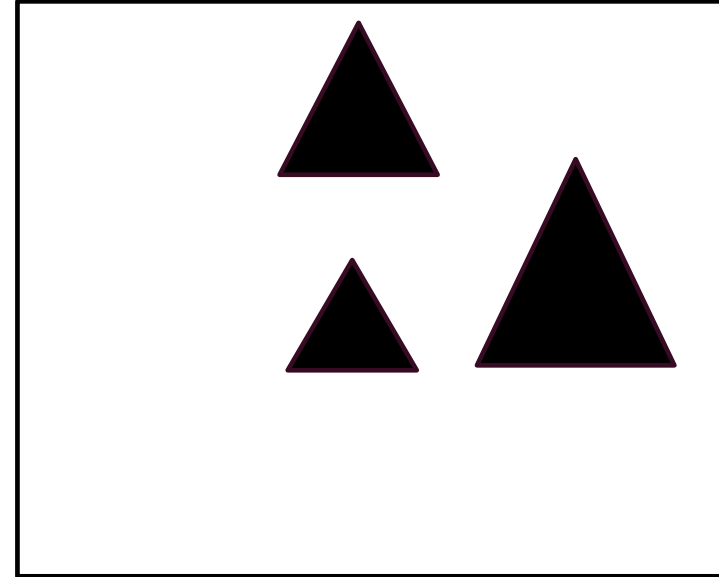
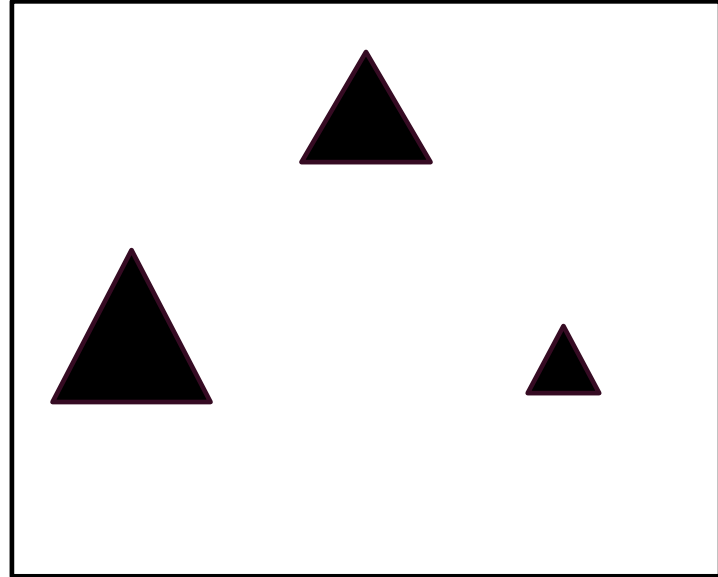


Smallest

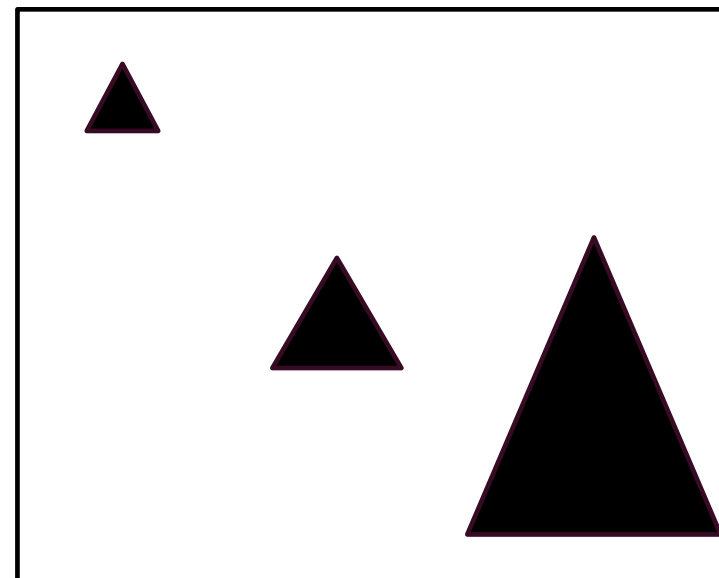
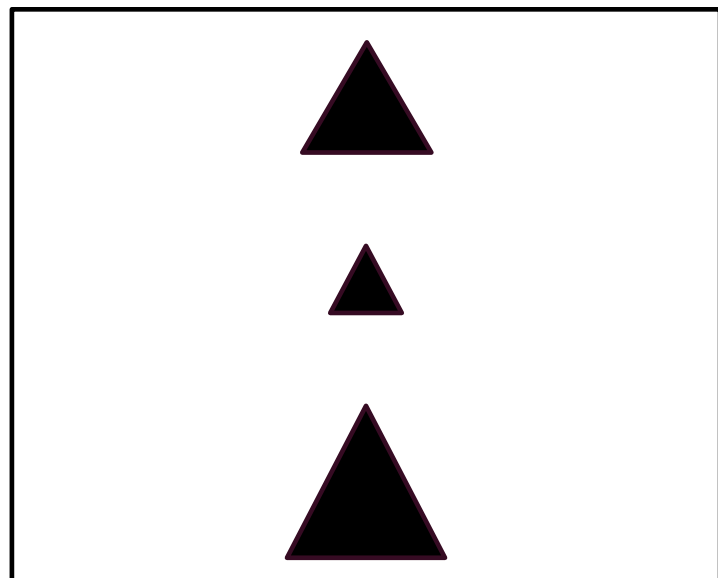




Smallest

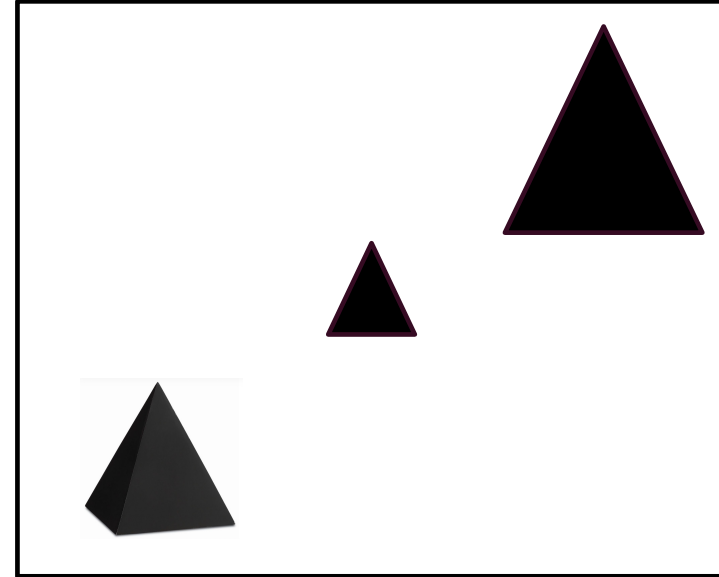
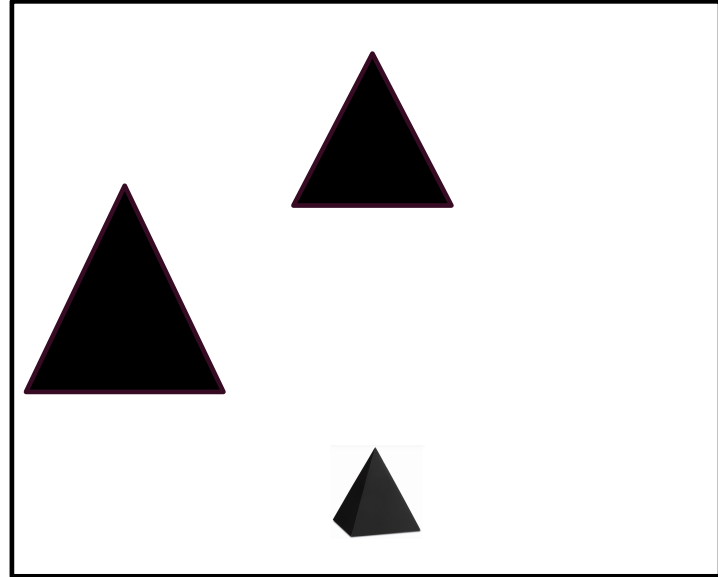


Biggest

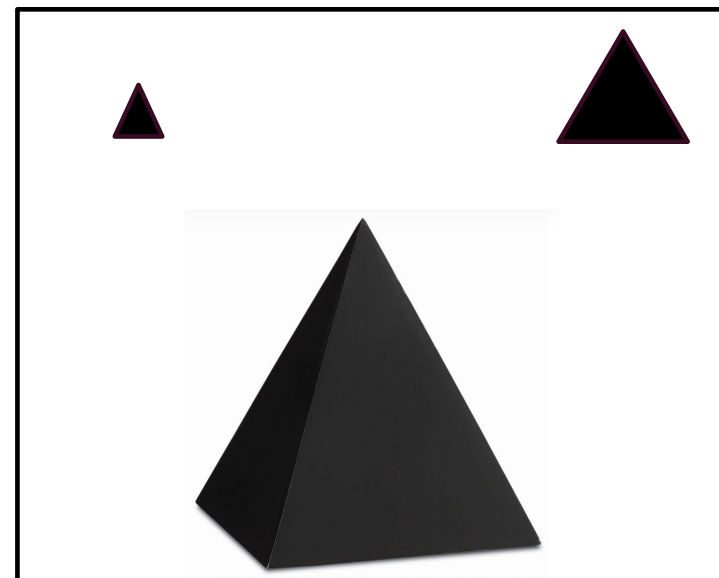
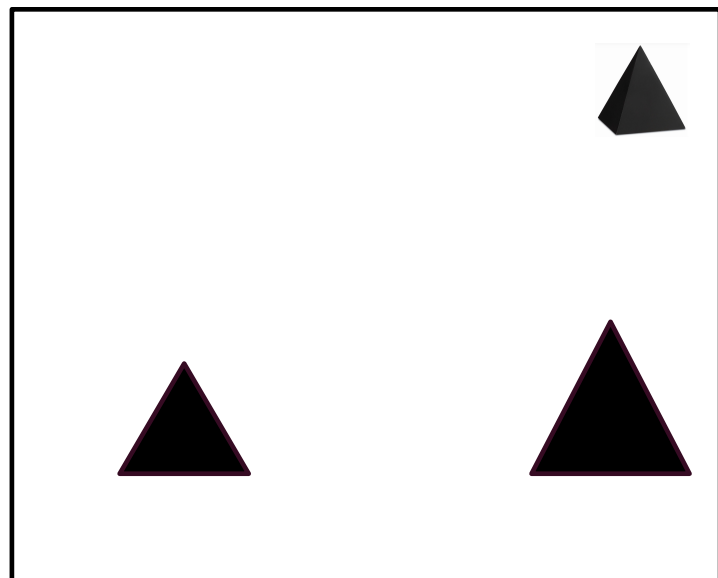




Smallest



Biggest





TIME TO PRACTICE



# CLINICAL CASE EXAMPLES

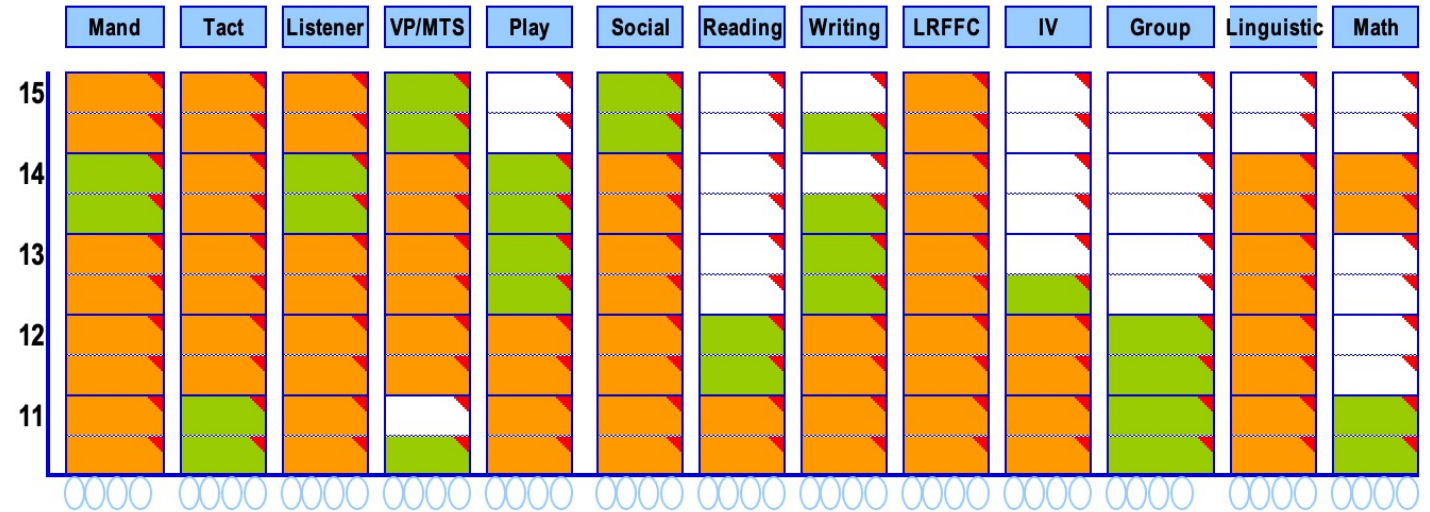


■ VB MAPP results

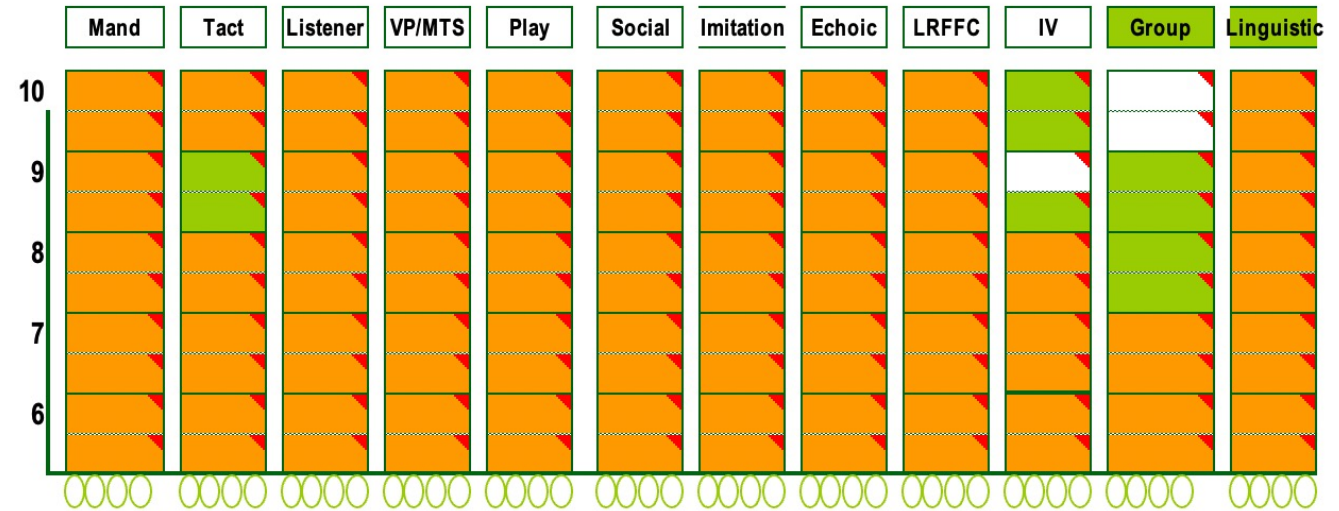
■ L. O. R. (5y7m; 6y7m)

■ SRS-2 Score 65 (Mild)

### LEVEL 3



### LEVEL 2



# MDML PRELIMINARY EVALUATION – L.O.R.

Level	Non arbitrary					
	Coord/Diff	Comparison	Spatial	Temp.	Opp.	Hier
1	100/0	100				
2	100/-	90				
3						
4						
5						

**RELATIONAL RESPONDING ASSESSMENT - NON ARBITRARY**

Name:

Date:

Check with Y (YES) for correct responses and with N (NO) for incorrect responses

**COORDINATION AND DIFFERENCE****LEVEL 1**

2 COMPARISONS - COORD	TRIAL	Y / N	NOTES
	1	Y	
	2	Y	
	3	Y	
	4	Y	
2 COMPARISONS - DIF	TRIAL	Y / N	NOTES
	5	N	
	6	N	
	7	N	
	8	N	
2 COMPARISONS VARIED POSITIONS - COORD / DIF	TRIAL	Y / N	NOTES
DIF	9	N	TEST ONLY COORDINATION
COORD	10	Y	
COORD	11	Y	
DIF	12	N	
3 / 4 COMPARISONS - COORD / DIF	TRIAL	Y / N	NOTES
3 - COORD	13	Y	
3 - COORD	14	Y	
4 - COORD	15	Y	
4 COORD	16	Y	
3 / 4 COMPARISONS - COORD / DIF - 2D/3D	TRIAL	Y / N	NOTES
3 - COORD	17	Y	
3 - COORD	18	Y	
4 - COORD	19	Y	
4 COORD	20	Y	



**RELATIONAL RESPONDING ASSESSMENT - NON ARBITRARY**

Name: L.O.R.

Date:

Check with Y (YES) for correct responses and with N (NO) for incorrect responses

**COORDINATION AND DIFFERENCE**

**LEVEL 2**

4 COMPARISONS - COORD	TRIAL	Y / N	NOTES
	1	Y	
	2	Y	
	3	Y	
	4	Y	
4 COMPARISONS VARIED POSITIONS	TRIAL	Y / N	NOTES
COORD	9	Y	
COORD	10	Y	
COORD	11	Y	
COORD	12	Y	
4-5 COMPARISONS - COORD	TRIAL	Y / N	NOTES
4 - COORD	13	Y	
4 - COORD	14	Y	
5 - COORD	15	Y	
5 COORD	16	Y	
5 COMPARISONS - COORD - 2D/3D	TRIAL	Y / N	NOTES
5 - COORD	17	Y	
5 - COORD	18	Y	
5 - COORD	19	Y	
5 COORD	20	Y	

**RELATIONAL RESPONDING ASSESSMENT - NON ARBITRARY**

Name:

Date:

Check with Y (YES) for correct responses and with N (NO) for incorrect responses

**COMPARISON****LEVEL 1**

2 STIMULI	TRIAL	Y / N	NOTES
BIGGEST	1	Y	
BIGGEST	2	Y	
BIGGEST	3	Y	
BIGGEST	4	Y	
2 STIMULI	TRIAL	Y / N	NOTES
SMALLEST	9	Y	
SMALLEST	10	Y	
SMALLEST	11	Y	
SMALLEST	12	Y	
2 STIMULI STRUCTURE	TRIAL	Y / N	NOTES
BIGGEST	13	Y	
SMALLEST	14	Y	
BIGGEST	15	Y	
SMALLEST	16	Y	
2 STIMULI 2D-3D	TRIAL	Y / N	NOTES
BIGGEST	17	Y	
SMALLEST	18	Y	
BIGGEST	19	Y	
SMALLEST	20	Y	

## RELATIONAL RESPONDING ASSESSMENT - NON ARBITRARY

Name:

Date:

Check with Y (YES) for correct responses and with N (NO) for incorrect responses

### COMPARISON

#### LEVEL 2

3 STIMULI	TRIAL	Y / N	NOTES
BIGGEST	1	Y	
BIGGEST	2	Y	
BIGGEST	3	Y	
BIGGEST	4	Y	
3 STIMULI	TRIAL	Y / N	NOTES
SMALLEST	9	Y	
SMALLEST	10	Y	
SMALLEST	11	Y	
SMALLEST	12	Y	
3 STIMULI STRUCTURE	TRIAL	Y / N	NOTES
BIGGEST	13	Y	
SMALLEST	14	N	
BIGGEST	15	Y	
SMALLEST	16	Y	
3 STIMULI 2D-3D	TRIAL	Y / N	NOTES
BIGGEST	17	Y	
SMALLEST	18	Y	
BIGGEST	19	N	
SMALLEST	20	Y	

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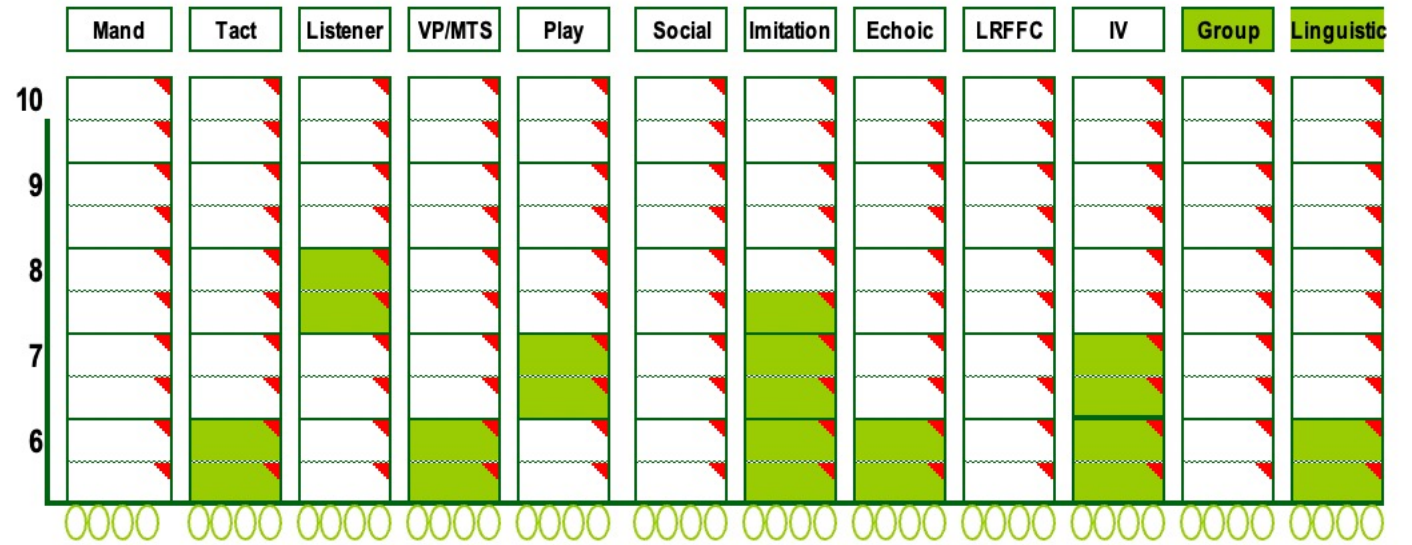
## L.O. R. NEXT STEPS

- Evaluate level 3 for coordination and comparison non-arbitrary relations.
- Evaluate levels 1 and 2 for coordination arbitrary relations.
- Train level 1 non-arbitrary difference relations.

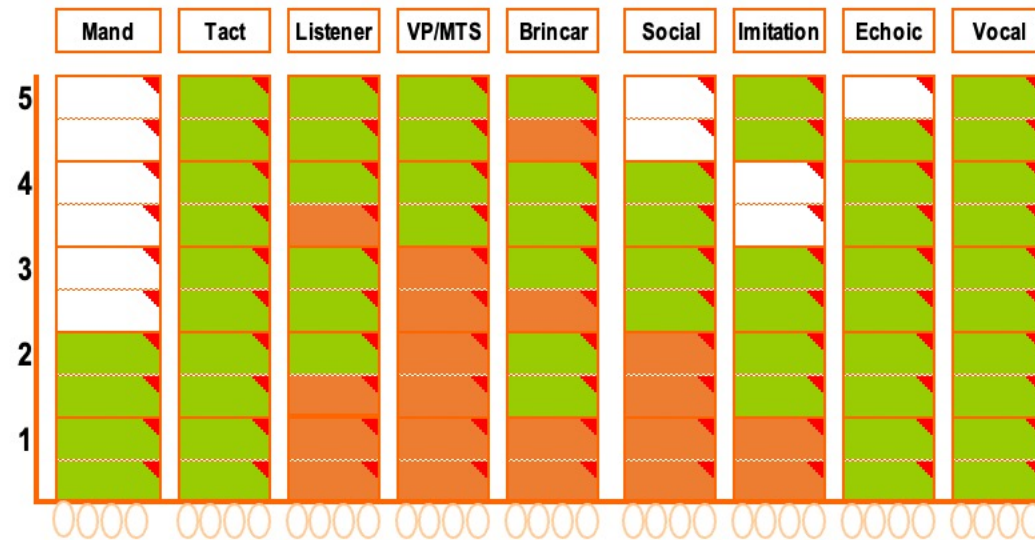
■ VB Mapp results

■ L.T.S. (3y2m; 4y8m)

■ SRS-2 Score 72 (Moderate)



LEVEL 1



**RELATIONAL RESPONDING ASSESSMENT - NON ARBITRARY**

Name: L. T. S.

Date:

Check with Y (YES) for correct responses and with N (NO) for incorrect responses

**COORDINATION AND DIFFERENCE**

**LEVEL 1**

2 COMPARISONS - COORD	TRIAL	Y / N	NOTES
	1	Y	
	2	Y	
	3	Y	
	4	Y	
2 COMPARISONS - DIF	TRIAL	Y / N	NOTES
	5	N	
	6	N	
	7	N	
	8	N	
2 COMPARISONS VARIED POSITIONS - COORD / DIF	TRIAL	Y / N	NOTES
DIF	9	N	TEST ONLY COORDINATION
COORD	10	Y	
COORD	11	Y	
DIF	12	N	
3 / 4 COMPARISONS - COORD	TRIAL	Y / N	NOTES
3 - COORD	13	Y	
3 - COORD	14	Y	
4 - COORD	15	N	
4 COORD	16	Y	
3 / 4 COMPARISONS - COORD- 2D/3D	TRIAL	Y / N	NOTES
3 - COORD	17	Y	
3 - COORD	18	N	
4 - COORD	19	Y	
4 COORD	20	Y	

**RELATIONAL RESPONDING ASSESSMENT - NON ARBITRARY**

Name:

Date:

Check with Y (YES) for correct responses and with N (NO) for incorrect responses

**COMPARISON**

**LEVEL 1**

2 STIMULI	TRIAL	Y / N	NOTES
BIGGEST	1	N	
BIGGEST	2	N	
BIGGEST	3	N	
BIGGEST	4	N	
2 STIMULI	TRIAL	Y / N	NOTES
SMALLEST	9	N	
SMALLEST	10	N	
SMALLEST	11	N	
SMALLEST	12	N	
2 STIMULI STRUCTURE	TRIAL	Y / N	NOTES
BIGGEST	13		
SMALLEST	14		
BIGGEST	15		
SMALLEST	16		
2 STIMULI 2D-3D	TRIAL	Y / N	NOTES
BIGGEST	17		
SMALLEST	18		
BIGGEST	19		
SMALLEST	20		

# MDML PRELIMINARY EVALUATION – L.T.S.

Level	Non arbitrary					
	Coord/Diff	Comparison	Spatial	Temp.	Opp.	Hier
1	80/0	25				
2	0/-	-				
3						
4						
5						



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## L.T.S. NEXT STEPS

- Train level I non-arbitrary difference relations.
- Train level I non-arbitrary comparison relations.

# DIMENSIONS

- **Coherence:**
  - Non-arbitrary procedures: using visual-visual elements in the training will make the coherence higher than employing stimuli with different sensory properties (tactile, olfactive).
- **Complexity**
  - For early learners complexity should be always kept as low as possible, in other words isolated relation-types and only the necessary number of elements for one specific level should be used. On the other hand, for more advanced learners, mixing different relation-types and adding more elements than the necessary in some given level could be desirable for refining their relational repertoire.
- **Derivation**
  - Employing familiar elements might likely lower the derivation level and non-familiar elements would likely have the opposite effect. (e.g., animal context vs teach a new language).
  - Sometimes it is useful to lower the derivation level to increase fluency at the same level across future opportunities
- **Flexibility:**
  - Try to employ different set ups for the stimuli presentation (other than traditional Matching to sample).
  - Use the same stimuli from one relation to other relations.

# THE MDML FRAMEWORK

<b>Levels</b>	<b>Dimensions</b>			
	<i>Coherence</i>	<i>Complexity</i>	<i>Derivation</i>	<i>Flexibility</i>
<i>Mutual Entailing</i>	Coh/Mut-Ent	Cpx/Mut-Ent	Dev/Mut-Ent	Flx/Mut-Ent
<i>Relational Framing</i>	Coh/Frame	Cpx/Frame	Dev/Frame	Flx/Frame
<i>Relational Networking</i>	Coh/Net	Cpx/Net	Dev/Net	Flx/Net
<i>Relating Relations</i>	Coh/Rel-Rel	Cpx/Rel-Rel	Dev/Rel-Rel	Flx/Rel-Rel
<i>Relating Relational Networks</i>	Coh/Rel-Net	Cpx/Rel-Net	Dev/Rel-Net	Flx/Rel-Net

# CONCLUSION

- The roots of RFT can be traced back to an early conference paper on rule-governed behaviour in 1984
- A full book-length treatment of RFT is now itself 20 years old
- Curiously, the potential impact of the RFT approach to human language and cognition in applied behaviour analysis is only now beginning to emerge
- One of the main reasons that RFT failed to make a significant impact earlier was its apparent complexity and the introduction of many new terms and concepts (some might say jargon!) unfamiliar to traditional behaviour analysis
- Furthermore, RFT lacked an overarching framework that attempted to organise and summarise its key assumptions and concepts

# CONCLUSION

- Many ABA researchers and practitioners understandably did not see any potential value in engaging with the theory in the absence of such a framework
- Hopefully with the introduction of the MDML in the general updating of RFT the much needed framework is emerging.
- This, we hope, will help ABA folks begin to utilise RFT in ways that hitherto could not readily be seen or appreciated
- Of course, this will take time and effort – but we hope that today's workshop will play some small part in that journey

THANK YOU! ANY  
QUESTIONS?

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