Applied Behavior Analysis

Session 1:
Course overview and basic concepts

My background

- Special Ed teacher in Victoria
- Special Ed teacher in junior vocational high schools in Canada
- BEd, MSc University of Calgary
- Special school principal Calgary
- Special education lecturer Griffith University

Organization

- Wednesdays 3:00-5:00 p.m.
- 3:00-4:30 content on weekly topic
- 4:30-5:00 discussion on practical work
- Interaction during the content session is encouraged
- Anything you are unclear about ask
- Examples from your experience are welcome

Topics

- Week 1: Basic concepts
- Week 2: The ABA process and behavioural objectives
- Week 3: Behaviour chains and discrete trial training
- Week 4: Antecedent control
- Week 5: Consequence control
- Week 6: Data collection and visual analysis of data
- Week 7: ABA, positive behavioural support, and punishment
- Week 8: Generalization, ethics and presentation of individual projects

Individual projects

- You are encouraged to implement the content of each weeks lecture into a project with a child in your class
- Choose an academic, social or daily living skill that you wish to teach to the child
- Raise issues during the discussion sessions each week
- Work with 3rd year students on their project

Additional reading

- Weekly reading on the topic
- Text:

Alberto, P., & Troutman, A. (2008) *Applied Behavior Analysis for Teachers (8th Ed).* Columbus OH: Pearson

- Week 1

Lindsley, O. (1992). Why aren't effective teaching tools widely adopted? *Journal of Applied Behavior Analysis,* 25(1), 21-26.

Session 1

Applied Behavior Analysis:
Basic concepts

The science of ABA

- Applied behavior analysis (ABA) is a widely used paradigm for the education of persons with a disability.
- It is an effective strategy and is evidence based:
  - Journal of Applied Behavior Analysis
    http://seab.envmed.rochester.edu/jaba/
  - Research and Practice for persons with Severe Disabilities
    http://www.tash.org/publications/RPSD/RPSD.html
  - Journal of Positive Behavior Interventions
    http://education.ucsb.edu/autism/JPBI.htm

The aim of this course is to make you familiar with the concepts and practices of this approach so that you can use them to teach students new skills.

ABA is:

- The science of applying the principles of behaviour change to the classroom
- The study of functional relations between behaviour and environmental variables that teachers can control (antecedents & consequences)
- Much broader than the intensive Lovaas approach used with children with ASD by AEIOU.
- Time on task and degree of structure are predictors of success (fidelity of interventions)

ABA:The essential tool of PBS

Proactive Strategies			Reactive Strategies
Ecological manipulation (Take time)	Positive programming (More immediate)	Direct treatment (More immediate)	Within the context of proactive plan

•Settings
•Change number and quality of interactions
•Instructional methods
•Instructional goals
•Environmental pollutants
•Number and characteristics of other people
 	
Smooth the fit between learner & environment
	•General skill development
	  •Chronological-age appropriate
	  •Functional
	  •Generalization
	
	•Functionally equivalent skills
	•Functionally related skills
	•Teaching coping/tolerance skills
	  •Generalized relaxation
	  •Desensitization
	  •Delay of reinforcement
	
	Change the individuals repertoire to deal better with the environment
		•Differential schedules of reinforcement
		  •DRO
		  •DRL
		•Remove S^d for problem behaviour
		•Instructional control
		•Stimulus satiation
		•Medication adjustments
		•Dietary adjustments
			(Immediate but no lasting effect)
			
			•Active listening
			•Stimulus change
			•Crisis intervention

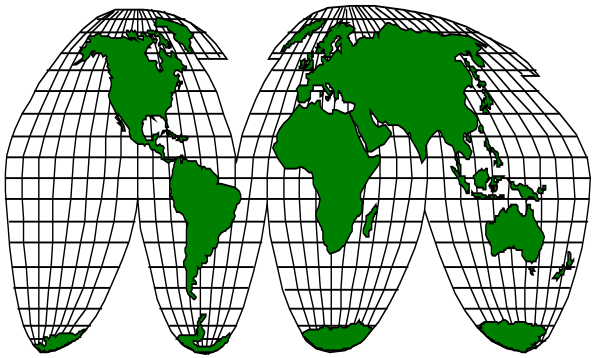
ABA, an essential tool of positive behavioural support

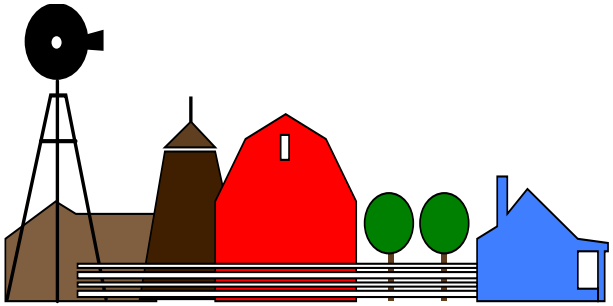
Behavioural science	Practical interventions	Lifestyle outcomes	Systems perspective
• Human behaviour is affected by behavioural, biobehavioural, social, and physical enviormental factors.	• Functional behaviour assessments are used to develop behaviour support plans	• Behaviour change must be socially significant, comprehensive, durable and relevant.	• The quality and durability of supports are related directly to the level of support provided by the host environment.
• Much of human behaviour is associated with unintentional learning opportunities	• Interventions emphasize environmental redesign, curriculum redesign, and removing rewards that inadvertently maintain problem behaviour	• The goal of PBS is the enhancement of living and learning options	• The implementation of practices and decisions is policy driven.
• Human behaviour is learned ad can be changed	• Teaching is a central behaviour change tool	• PBS procedures are socially and culturally appropriate. Applications occur in least restrictive natural settings.	• Emphasis is placed on prevention and the sustained use of effective practices.
	• Research validated practices are emphasised	• The fit between values of students, families, and educators must be contextually appropriate.	• A team-based approach to problem solving is used.
	• Intervention decisions are data based	• Nonaversive interventions(no pain, .tissue damage or humiliation) are used	• Active administrative involvement is emphasized.
			• Multi systems (school, district, classroom, non-class) are considered
			• A continuum of behaviour support is emphasized.

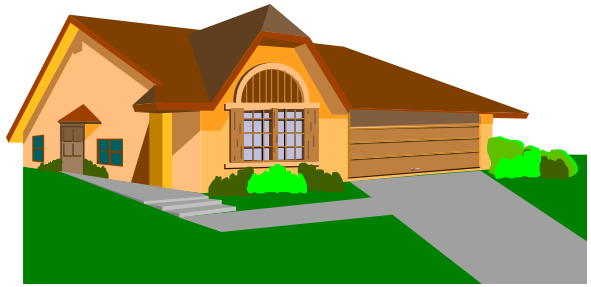
(Sugai et al, 2000)

Applied Behavior Analysis

Applied: Selecting socially relevant behaviours for change (ecological validity)

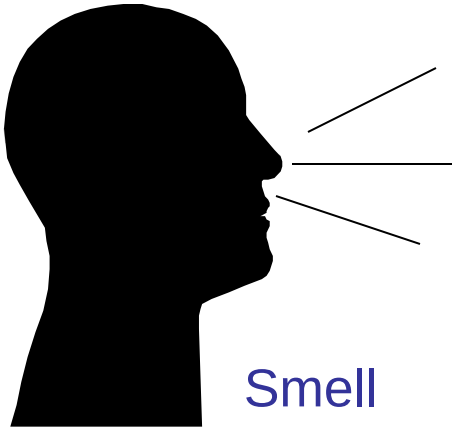


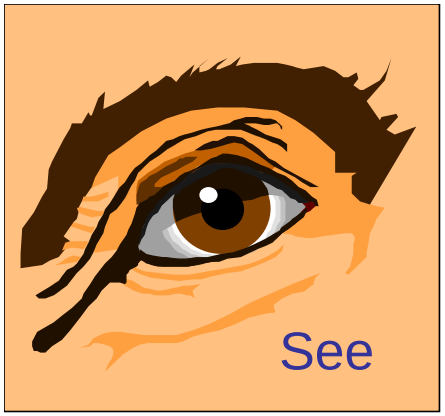




Applied Behavior Analysis

Behaviour: Events that are observable and measurable



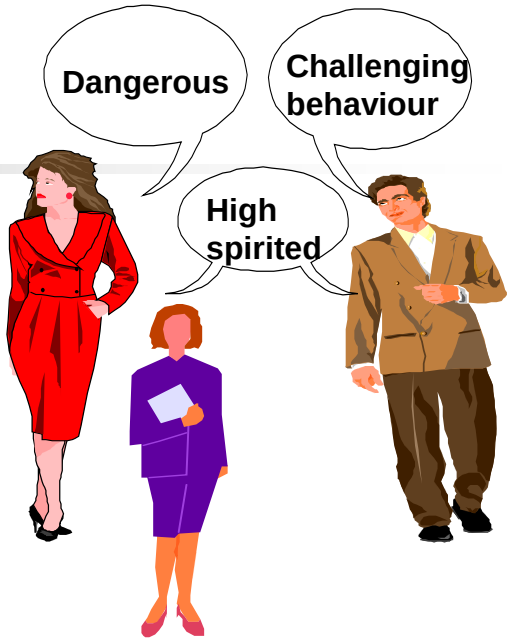


Behaviour
Observable & Measurable

- Colin is out of his seat and running around 80% of the day
- Mary cannot correctly complete addition within 10 using concrete materials
- John is 15 and cannot speak, tie shoes etc
- John pulls away whenever anyone touches him

- Colin is hyperactive
- Mary is poor at maths
- John has high support needs
- John is tactile defensive

Mentalistic terms



“Poor”

“Hyperactive”

“High support needs”

“Tactile defensive”

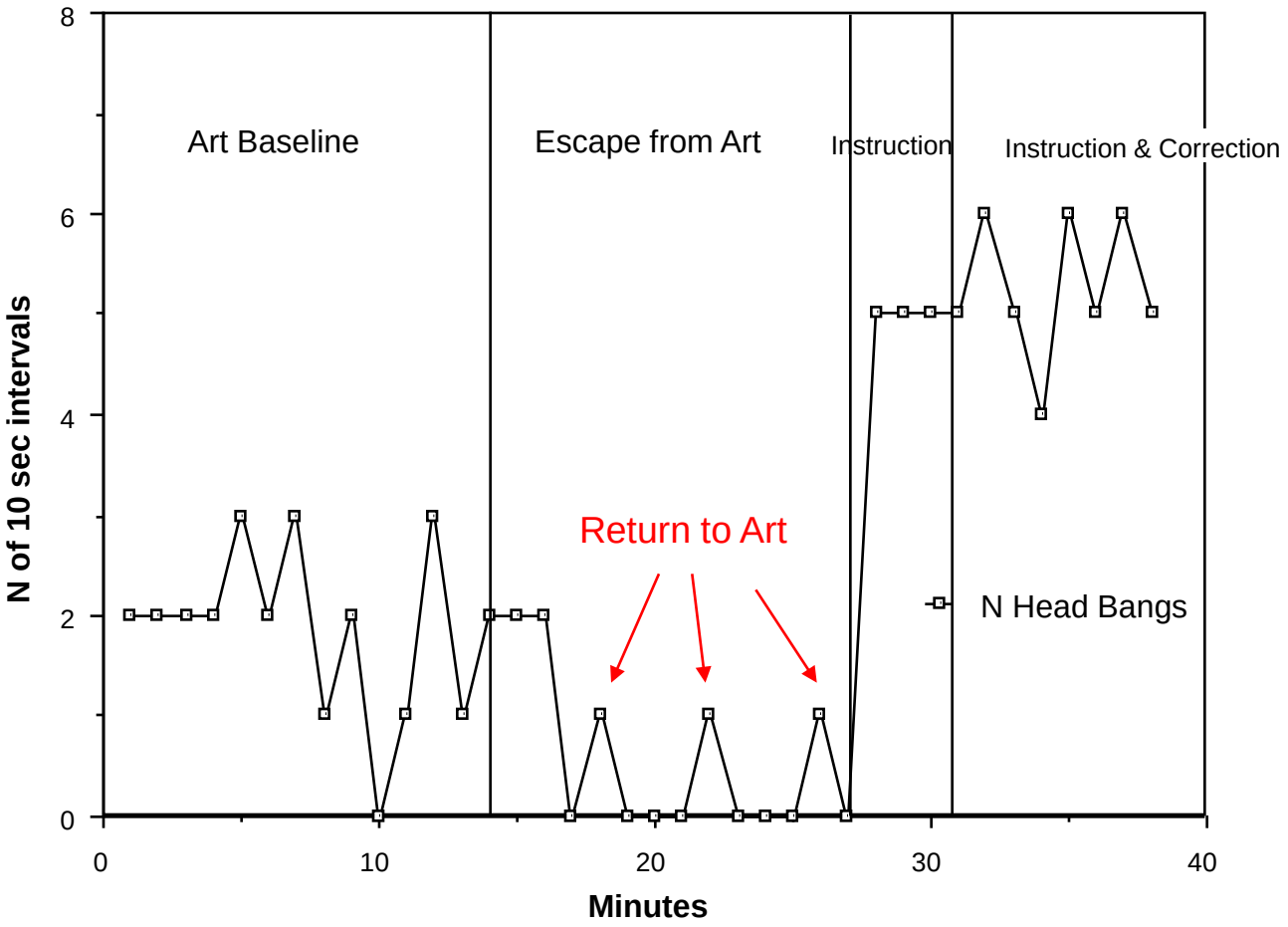
Explanatory fictions

Applied Behavior Analysis

- Did the strategy result in behaviour change?
- Was it your strategy that created the change…
- …or were external setting events of which you were not aware responsible for the change?
- The manipulation of independent variables (teaching strategies) to change dependent variables (the target behaviour)

Did escape influence SIB?

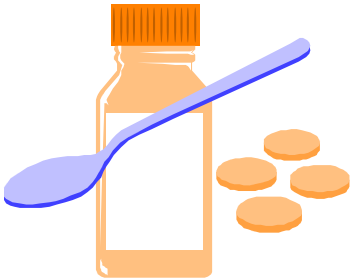
N of 10 sec intervals per minute in which head bangs were recorded.



Behavioural approaches :

- All behaviour is learned
- Behaviour is observable and measurable
- Behaviour can be improved or changed
- Strategies are data driven
- Strategies are fairly simply explained
- Other approaches

Medical approaches



- Genetic and hereditary effects (Down Syndrome, ASD, Rett Syndrome
- Biochemical causes (e.g., phenylketonuria [PKU], food additives (e.g., Feingold diet)
- Neurological approaches:
  - Ralph is hyperactive because he runs around a lot
  - Hyperactivity is caused by brain damage
  - Therefore Ralph has brain damage
- All are very real but may not be helpful educationally

Medical approaches

- Positive aspects:
  - Removes blame for the behaviour; the need to "know" the cause of the disability
- Negative aspects:
  - May remove responsibility for initiating behavioural change programs by stereotyping (e.g., can children with ASD develop the proto-declarative?)

Developmental approaches

- Psychoanalytic stage theory (oral, anal, phallic, latency, genital).
- Cognitive stages (Piaget, sensorimotor, preoperational, concrete operations, formal operations).
- The importance of understanding the development of cognitive processes to which behavioural strategies can be applied (e.g., 1-1 correspondence in math; phonological awareness in reading; communicative intent in non-verbal communication).

Cognitive Constructivism

- Guided discovery learning where students construct their own knowledge; zone of proximal development; scaffolding (Vygotsky)
- Assists students to focus attention on relevant attributes of the task
- External to internal control
- Close to behavioural approach

Basic assumption of ABA

- Operant conditioning:
  - Operant behaviour emitted by the child
  - Where the probability of the occurrence of a behaviour is determined by the history of its consequences
  - The child emits the target behaviour in anticipation of a positive consequence
  - Consequences (reinforcers) can be primary, secondary and intrinsic

Classical (respondent) conditioning

Pavlov and his dog

Non-voluntary behaviours elicited by the stimuli that precede them.

Unconditioned stimulus → Unconditioned response

Meat → Salivation

S → R

Meat& Bell → Salivation

S → R

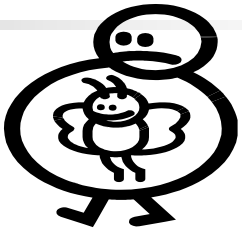
Bell (Conditioned stimulus) → Salivation (Conditioned Response)

Fight

Flight

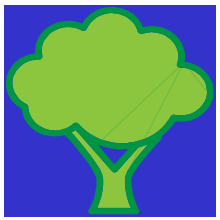
Fright

A Brisbane example

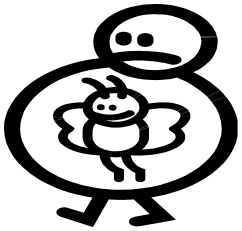


Unconditioned stimulus (exam time)

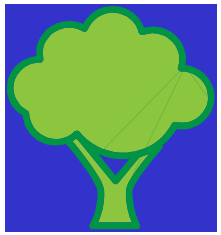
Unconditioned Response (nervousness)



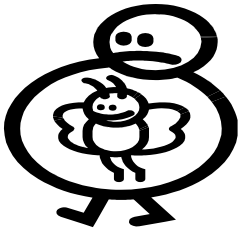
Stimulus exam time always paired with jacarandas in bloom



Response (nervousness)



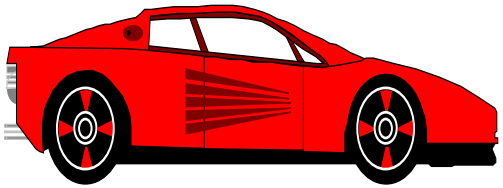
Conditioned stimulus



Conditioned response (nervousness)

Operant (instrumental) conditioning

Where voluntary behaviours are emited by the stimuli that follow them.



Antecedent

Behaviour

Consequence

(avoid fine or accident)

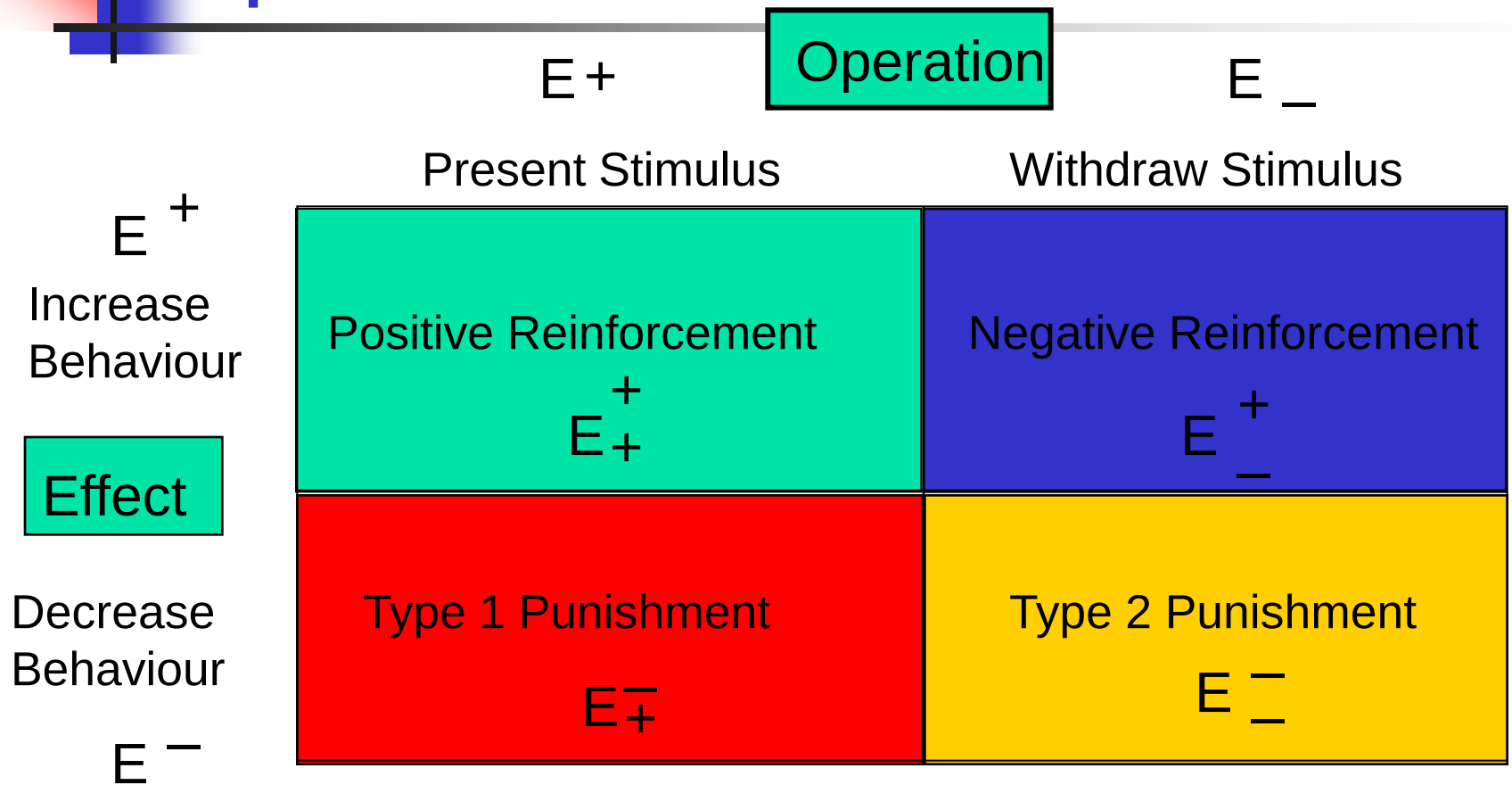
Operant conditioning

- Operant behaviour is behaviour that is controlled by its consequences
- The functional relationship between antecedents (teaching strategies), the manner in which the student responds (student behaviour), and the manner in which he environment responds to the behaviour (reward/reinforcer).

Operant conditioning

- The trick is:
  - To provide antecedent conditions that bring about a correct response…
  - so that the correct response can be given a consequence…
  - that is valued by the child…
  - and is likely to be repeated in that situation in the future.

Reinforcement and punishment



E = Effect

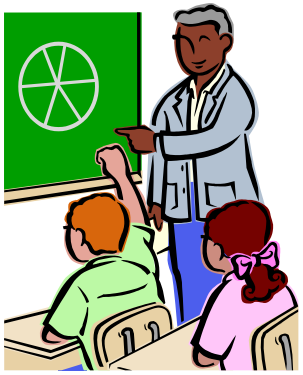
Positive reinforcement

An increase in target behaviour as a result of the function of the presence of the consequence

Increases the probability that the correct response will occur again in the same context

Antecedent
(concrete materials)

Behaviour
(correct response)



Consequence
(preferred activity)

Negative reinforcement

- Erroneously thought of as a punisher
- Has the effect of increasing the target behaviour…
- by eliminating, reducing or avoiding an aversive stimuli as the consequence

Negative reinforcement

Increasing target behaviour by avoiding, reducing or eliminating aversive stimuli.

Increases the probability that the correct response will occur again in the same context

Antecedent
(concrete materials)

Behaviour
(on task behaviour)

Consequence
Avoids losing games time

Punishment

- When a target behaviour is reduced as a result of its consequence then the consequence was punishing.
- Any action that reduces the target behaviour, whether pleasant or unpleasant, is a punisher.

Type 1 punishment

The use of aversive stimuli to reduce a target behaviour

Antecedent

Behaviour
(lack of)

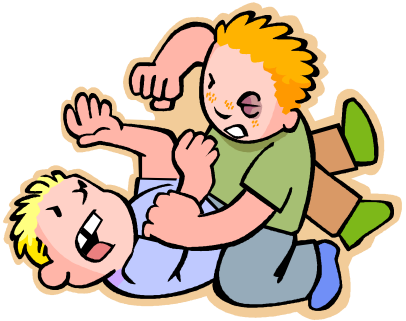
Consequence
Any action that reduces a lack of response is a punisher

Type 2 punishment

The use of response cost to reduce a target behaviour.
Time out from reinforcement.

Antecedent (work time)

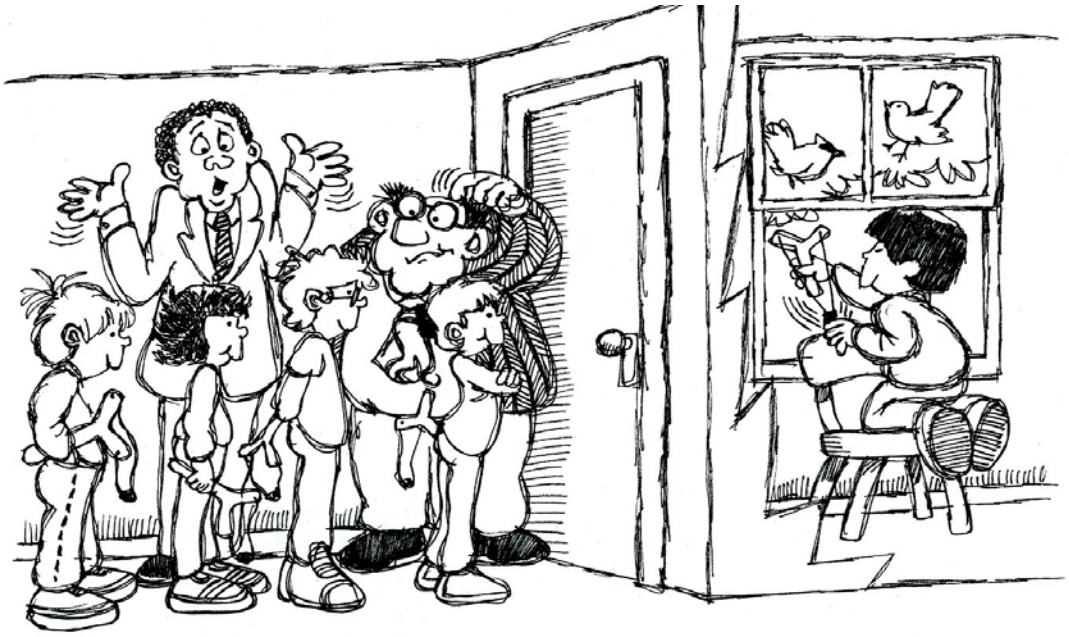
Behaviour (fight)



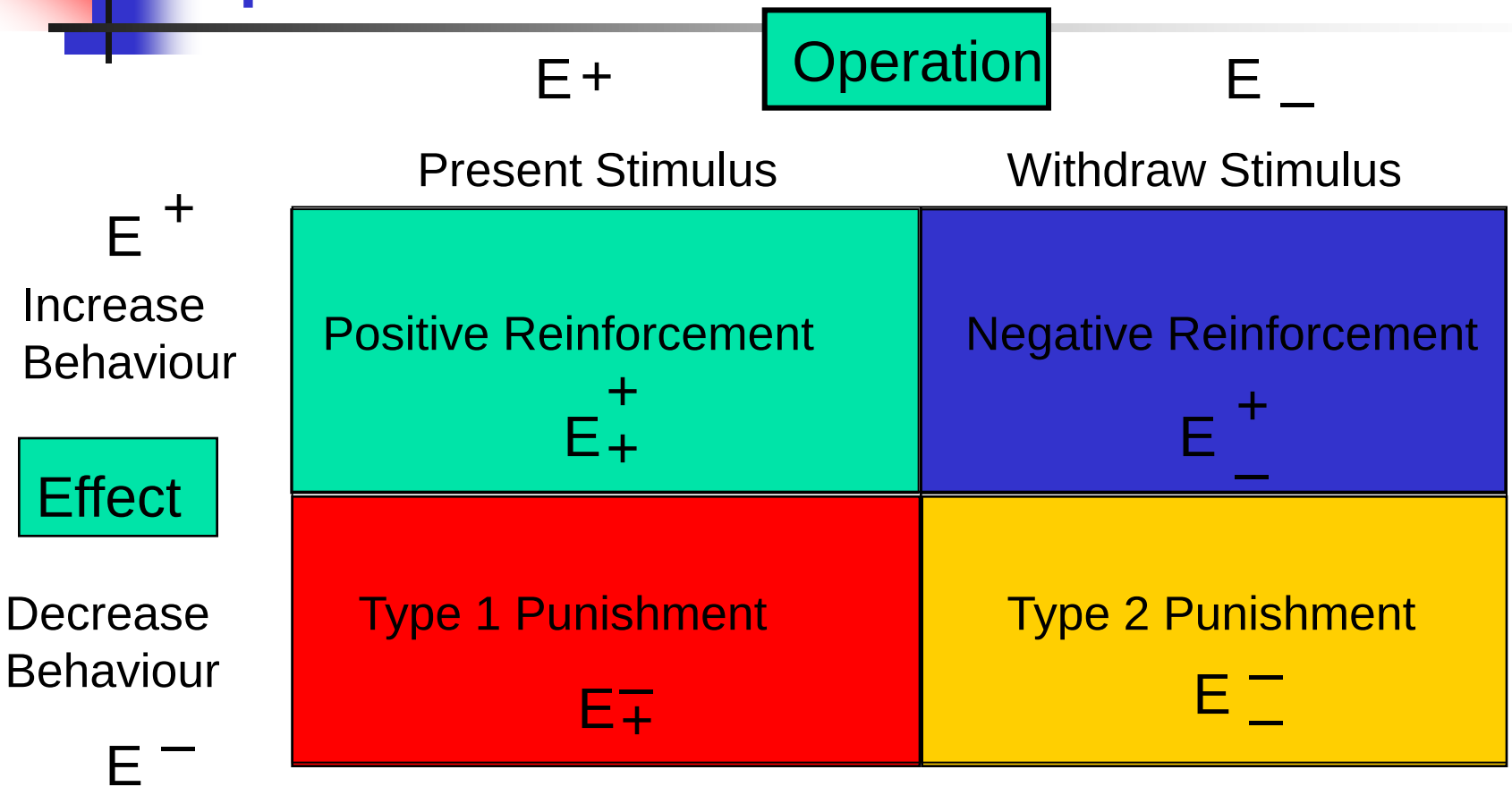
Consequence (Go to jail / time out)

Careful how you use time out

Time out means time out from reinforcement.
In this case, time out negatively reinforces the behaviour that initiated it.



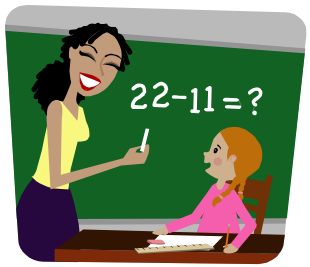
Reinforcement and punishment



E = Effect

Functions of behaviour

- If we don't understand the functions of behaviour, we may inadvertently reinforce the very behaviour we are trying to eliminate



Antecedent (work time)

Behaviour (tantrum)

Response (pay attention)

The more intermittent the reinforcement, the more the response is strengthened

Educational Implications

- As teachers we get involved in:
  - Presenting suitable antecedents
  - To produce an increase in target behaviour
  - So that we can give a reinforcing consequence…
  - And thus increase the probability that the appropriate behaviour will occur in that or similar situations in the future (generalization & maintenance)

ABA strategies:

- Assist students to:
  - focus on the relevant attributes of a task
  - Move from external control to internal control of their behaviour.

End

Session 1: Basic ABA concepts